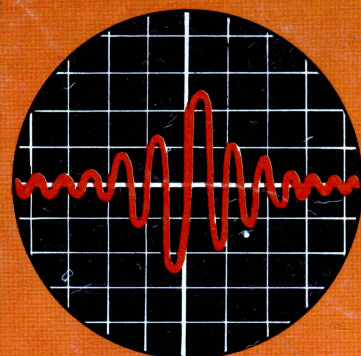


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ISSUE 2  
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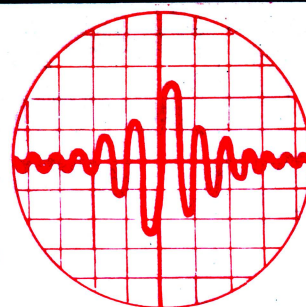
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## PUBLISHER

AMATEUR RADIO ACTION is published monthly by NEWSPRESS Pty. Ltd., a division of Age Publications, 603-611 Little Lonsdale St., Melbourne, 3000, P.O. Box 628E, Melbourne. 3001.

AMATEUR RADIO ACTION is distributed in Victoria by Magdiss Pty. Ltd., 250 Spencer Street, Melbourne 3000; in NSW by Allan Rodney Wright (Circulation) Pty. Ltd., 221 Liverpool St., Darlinghurst 2010; in S.A. by B.G. & K.L. Fuller, 105 Main Street, Beverley, 5009; in Tasmania by The Mercury, 93 Macquarie Street, Hobart 7000; in Queensland by Mirror Newspapers Limited, Cnr. Ann and Marshall Streets, Fortitude Valley, Queensland. 4006; in W.A. by Gordon and Gotch.

Printed Web offset by Waverley Offset Publishing Group.

The price set out or referred to herein is a recommended price only and there is no obligation to comply with the recommendation. All prices referred to in A.R.A. are recommended prices, unless otherwise stated.

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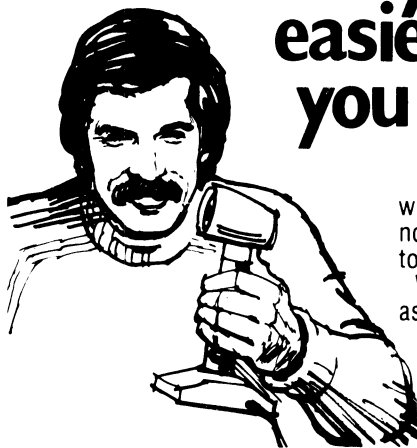
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The new Icom, IC-730 all band, HF amateur transceiver put through its paces this issue.

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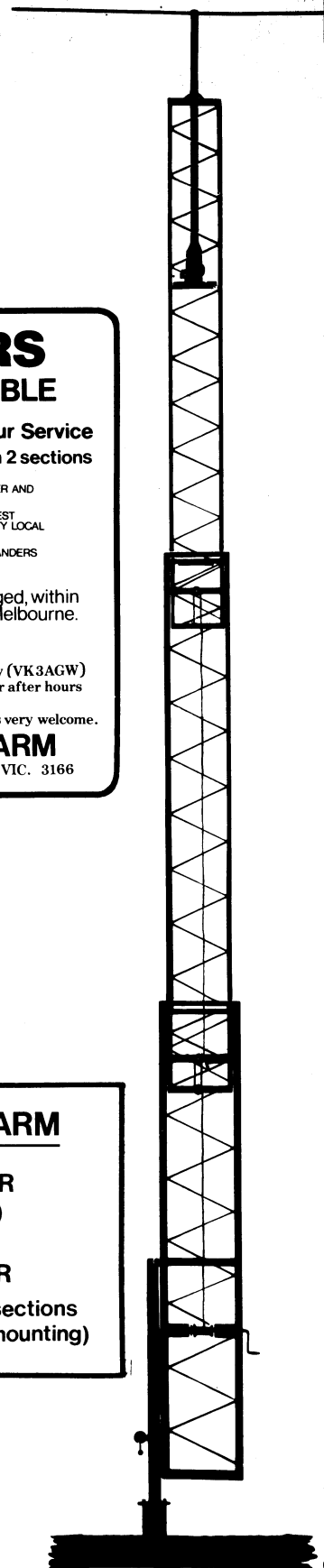
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# Editor's Log

*TWO recent incidents concerning repeater operating protocol offended a few Melbourne amateurs and confused many others.*

*One conflict arose when a newly licensed, inexperienced operator called CQ via the channel 5 Mount Macedon repeater during the course of an official WICEN (Wireless Institute Civil Emergency Network) exercise. His reception by the control official was less than welcome and the new call was offended by what he considered unfair treatment when he was politely asked to vacate the frequency.*

*The second incident was formulated along similar lines and the new operator was surely incensed when told to put away his 'toy' handheld transceiver. While there is the essence of disrespect in such a comment by the control operator, it must be conceded that there are two sides to every story.*

*I spoke with control operator, Peter Mill, about the incidents. He was regretful that either operator should be offended by his attitude and he stated emphatically that no intimidation was intended.*

*It should be realised that the task of net control during a simulated emergency exercise is arduous and the official must be 'matter of fact' by virtue of his responsibility. The incidents have been since passed on by word of mouth until distortion of the facts eventually provided a foundation for unkind rumours about operating conditions applying to VK3RMM.*

*The Mount Macedon repeater is designated 'WICEN priority' and in the event it is required for emergency service, all operators should necessarily vacate the channel. Because of the priority rating, operators are asked to comply with the official WIA guidelines for repeater operation - particularly in keeping QSOs brief and to-the-point. In this way the repeater is made readily available for urgent traffic when the need occurs. At present there are no other special restrictions on the channel, except that long group QSOs should be avoided. To my knowledge, no station has been asked to permanently vacate the channel.*

*But please, use a bit of common sense when operating through any repeater. Repeaters perform a valuable service for mobile amateur communications, but they are a limited resource and should be accorded the proper respect. A great deal of effort is contributed by volunteer staff to keep repeater services in operation and it is totally wrong for any amateur to believe that he or she has a monopoly on precious repeater time. Repeaters are not a right — they are a privilege for all suitably licensed amateur operation, however, like any other resource, certain restrictions are necessary and they must be observed for the benefit of all.*

*Some operators tend to take repeater operation for granted, and when a service fails, the committees responsible for maintaining the equipment are frequently objects of caustic criticism. If the critics would only ask themselves if they could, or would be prepared to do a better job, perhaps there would emerge a greater respect for the translators and the dedicated groups of amateurs who provide the service. Think about it.*

*While on the subject of repeaters, it certainly will not do any harm to mention a few DOs and DON'Ts about good manners.*

*Calling CQ via a repeater is acceptable but not in the usual sense. It is usually only necessary to announce your call sign and state your intention — prolonged HF CQ techniques are definitely OUT. Lengthy CQs consume valuable repeater 'on air' time and become a nuisance to all listeners. Your first call will be heard. If an operator wishes to converse he or she will reply shortly.*

*Call another station by all means, but again, make it brief. If you receive no answer, don't repeat the call continuously, you are just inviting trouble — usually a bit rude when it comes. The called station might not be available at the time, or may not wish to answer — so why embarrass anyone by fruitless repetitive calls.*

*When in contact through a repeater make your 'overs' brief and to the point. Say what needs to be said then clear the frequency quickly, especially during peak operating periods. If you can, always check the input frequency to see if you can hear the other station 'direct'. If you can communicate direct, so much the better. Acknowledge the fact on your next over and arrange to meet on a 'quiet' channel to complete your conversation. Using the repeater needlessly is bad manners and you might be holding up other users who can't make direct contact.*

*Always leave a pause of several seconds between overs and allow breakers to make their presence known. Breakers should be acknowledged immediately and given a fair chance to call another station. There might be important traffic to be passed and hogging the channel could spell disaster for someone else. At best, it is impolite to exclude another station from the same rights you are enjoying.*

*Above all — use common sense.*



# Phone patching... Why not?

by Jim Linton VK3VKC/VK3PC

The right to use phone-patching will be granted — but don't hold your breath waiting for it to be officially approved.

Phone-patching is an integral part of third party traffic handling and is particularly popular among U.S. amateurs. Just tune in on the HF bands and you'll hear phone-patch contacts in progress, including some between mainland USA and its possessions and bases in the Pacific.

Australian operators have had third party privileges for about a year now and an agreement has been reached with Canada for the passing of third party traffic between VK and VE. Negotiations are continuing with the USA and at least one European country seeking a similar agreement.

The Department of Communications is in favor of amateurs being able to use phone-patch — but it appears to be a matter for Telecom to approve access to the telephone network.

In July, 1980 DOC wrote to Telecom seeking their comments on the matter of third party traffic. This was before the then P&T Minister Tony Staley had made his historic announcement approving the handling of such traffic.

Looking back it's unfortunate that Mr Staley didn't go all the way and include in his statement the word "phone-patch".

Up until Christmas Eve, 1980 Telecom approved phone-patch equipment was avail-

able on the market with no restrictions on who could use it.

Since then Telecom has restricted the availability of the phone-patch gear to business communications only. It goes as far as saying that phone-patch is not for "personal use" and names the amateur service as being prohibited access to the phone network. This discrimination against amateurs, and other personal communicators including CBers, has only existed since last Christmas.

The reason for this restriction appears to be a fear of loss of revenue by Telecom by amateurs using the airwaves instead of the phone network. This argument isn't valid, Telecom's sister organisation — the Overseas Telecommunications Commission (OTC) — doesn't fear losing revenue because of overseas third party traffic.

The introduction of mobile two-way radio systems in Australia was also opposed in the early days on these same grounds. Again, early fears proved to be unfounded.

There is a body of opinion among some industry sources that believe Telecom has no legal right to prevent any radio user access to the phone network. These same sources are convinced that Telecom couldn't take action against an amateur for using approved phone-patch equipment. Only time, and perhaps a battery of expensive legal representatives, will determine if this is true.

The Department of Communications, which has no objection to phone-patching, is making further representations to Telecom in regards to the Amateur Service.

The author of this article conducted a phone-patch experiment using 15 metres on March 31 — after deciding it was safe to do so following discussions with a senior Telecom officer.

A cut-down plastic cup was used to acoustically couple the earpiece end of a phone handset to the microphone of a SSB transceiver. A pair of headphones from the rig were then clamped to the phone mouth-piece.

The phone being used was rung from a second phone and the caller, who was the station licensee, was able to conduct a QSO via the telephone network. Switching from receive to transmit was achieved by operating the transceiver in the VOX mode.

Audio quality suffers a little with the use of acoustic coupling but providing on-air conditions are good this method appears fairly successful.

While not anticipating any legal action following the experiment it will be for individual amateurs to decide whether they can carry out such tests.

Present thinking by DOC is that it will allow all grades of amateurs, including Novices, to use phone-patch after the stumbling block of Telecom is overcome.

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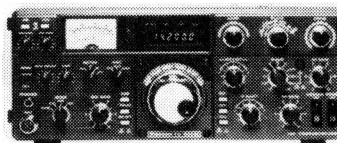
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# ERIS

**Squabbling is still going on world-wide regarding the usage of the new 10 MHz band. Australia appear to be out of step with most countries in the rest of the world who are preferring narrow band modes (such as CW and RTTY) only. Australia appears to be pushing for multi-use including single side band. There is also some contention world wide regarding the use of the band for contests.**

★ ★ ★

DOC have recently been investigating the administrative costs of running the amateur radio service, these would be far in excess of the cost per licence for other services in Australia. No doubt, this is a reflection of a very poor administrative procedure - particularly in respect to licence allocation, application and renewal - which has been very poorly handled over the last ten years.

While there are longer term aims to computerise this operation, the present system is very heavy in manpower requirement. Fortunately, DOC are moving towards the concept of user self-regulation and this will mean greater responsibility for the amateur radio service and (hopefully) lower bureaucracy costs and hence lower taxes to us the taxpayers. DOC should be solely involved with policy matters regarding spectrum management and licence applications, administration could be conducted very simply by computer. No doubt DOC would like to see the amateur radio service disappear as the amateur service is a well known nuisance factor to their normal day to day activities.

Whether the amateur service is able to accept increased responsibility is a matter of conjecture and there is a segment of amateurs who currently believe that there are too many nit-wits who are incapable of supporting a self-regulated system. Certainly, public and political pressures and the feeling of the 1980's is for less government/less regulation and hopefully this will flow into DOC attitudes.

★ ★ ★

**Talk is going on in the amateur fraternity overseas regarding implementation of an additional ITU region - there are three world radio regions at the moment. The current feeling is that Region 1, which covers Europe and Africa should be split to create a new region which would include the African states. These Third World countries are being supported by Russian intentions to obtain more votes and greater influence in all aspects of ITU administration. It is not likely that Australia would support a fourth ITU region.**

While talking about the world scene it is a continual disappointment to the amateur radio service in our region that Japanese amateurs are contributing so little financially to the running costs of Region 3. Australia per capita is paying considerably more than the Japanese, who in many respects have the most to gain or lose from a viable Region 3.

When one considers that most of the equipment manufactured in the world for the Ham Radio Service originates from Japan there is a huge multi-million dollar investment in the future and security of amateur radio privileges in the world. Yet Japan contributes very little and suprisingly the JARL is a very conservative, even bordering on negative, ham radio organisation.

The average wage in Japan is not very different from that of Australia and it is reasonable to support a theory that amateurs in both countries should both be contributing the same per capita contribution to Region 3 costs. Similarly, there is no excuse in the other less developed countries in the region for a lower per capita participation, as in most cases, it is only the wealthy elite of the countries who are able to afford the luxury of amateur radio as a hobby.

★ ★ ★

**The WIA has still done nothing to encourage a National Convention in Australia to replace the myriad of pathetically small and poorly attended exercises held in various parts of the country. The Kiwis certainly know how to run a convention as several delegates from the WIA in Australia have found out. While talking about New Zealand, they have finally seen the light and are now busily converting their repeaters to 600 kHz offset!**

★ ★ ★

Unconfirmed rumours indicate that a number of Australian amateurs travelling on holidays in China have received permission to operate their amateur radio stations there. Eris would like to hear from amateurs who have been granted this privilege and if this is the case, it would support widely held views that China will permit amateur operation in that country within the next two years.

★ ★ ★

**At the time of writing Federal Parliament had not considered the first reading of the Radio Communications Act and with the present upheaval in Parliament there is now considerable doubt as to whether it will be considered at all during 1981. Another year has passed again!**

Amateurs who have some acquaintance with the new Australian satellite system will be amazed at the bureaucracy and shocking technical planning of this particular device. This is going to be a debacle in the true DOC tradition and already, the dog's breakfast approach to usage has made the project laughable.

★ ★ ★

**Considerable interest was aroused by a piece in Eris (Vol. 3, No. 12) relating to the use of the AX prefix by Australian amateurs. Eris reported that certain DOC officials were concerned that the callsign was not being used enough and voice concern that the callsign might be withdrawn. It is a fact that the last time the callsign was used was for the Cook Bicentenary in 1970.**

The Department of Communications and the WIA have agreed that the AX prefix should be used more often, although there is now conflicting reports as to whether DOC had considered withdrawing the allocation.

In any event, new guidelines for the use of the prefix have been drawn up. As reported in the WIA Journal Amateur Radio, such use will, except in special circumstances, be restricted to a continuous period of two months, not earlier than two years from the last day of the previous period of such use. Perhaps of greater concern, the time of such use shall be nominated by the Wireless Institute of Australia.

Eris has long sympathised with DOC over their lack of manpower, but must question the decision to abrogate the responsibility for frequency management in this manner. An individual applicant has attempted to have the callsign prefix used for the period of the royal wedding in July but the WIA refused to sanction his application despite the support of state level officials in the WIA. The Federal body prefers to use the prefix for the Commonwealth Heads of Government meeting to be held in Melbourne later this year. Queenslanders would also like to see the prefix used for the 1982 Commonwealth Games.

The applicant has now applied directly to DOC for an allocation, let's hope a decision can be made quickly.

★ ★ ★

*ERIS is an independent opinion column and the views expressed here are not necessarily shared by the staff and or the publisher of Amateur Radio Action.*

ARA



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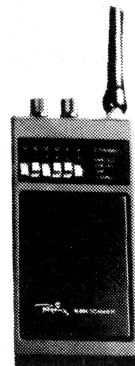
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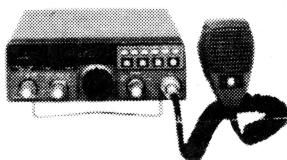
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## NEW HF BEAM FROM CHIRNSIDE

CHIRNSIDE ELECTRONICS have recently released an additional tri-band beam to their already extensive range of mono and multi-band antennas.

The new addition is the model CE-35DX, which features 20, 15 and 10 metre operation with the use of traps for automatic band selection.

Unlike their early model CE-35, which features 3 elements on each band, the model CE-35DX features 3 elements on 20, 3 elements on 15 and 4 elements on 10 metres, all mounted on a 6 metre long boom (19'3"). The average gain is given as 9.5 dB and the average front-to-back ratio is given as 25 dB. Chirnside claim the new antennas are capable of handling up to 2kW PEP.

Like all other Chirnside antennas the new model features heavy duty elements made of high grade aluminium. Elements with traps in them start at 30mm or 25 mm in diameter depending on the amount of traps used. The two elements without traps start at 19 mm and taper down to 12 mm and are neatly finished with plastic end caps on all elements. Stainless steel compression clamps are used at the adjustable joining sections for strength and durability. These allow for easy adjustment where necessary.

Assembly of the CE-35DX antenna is made easy through the use of a colour coding system, as featured throughout the existing range of their antennas. The approximate weight of the antenna when packed is 24kg. The recommended retail price of the CE-35DX is \$299.

Chirnside antennas are now available from some interstate and country dealers. Contact Chirnside Electronics for your nearest dealer. Their address is 26 Edwards Rd., Chirnside Park, Lilydale, Vic. 3116. Phone (03) 726 7353.

## ANTENNA RESTRICTIONS FOR VICTORIA?

A MAJOR TOPIC of conversation for amateurs in the Melbourne area in recent weeks has been a proposed amendment to the Melbourne Metropolitan Planning Scheme which would place drastic restrictions on the erection of masts and antennas. The amendment would alter the Planning Scheme to make it necessary for anyone wishing to erect a radio mast with a height exceeding eight metres, or horizontal dimensions exceeding three metres, to obtain a planning permit. The planning permit may be subject to any reasonable conditions the planning authority (usually the local council) may wish to impose and would be in addition to any building permit required by city engineers.

At present anyone wishing to erect a tower is required to obtain only a building permit. The proposed amendment would leave the way open for local councils to refuse an application on any number of grounds, with the basic aim of preventing the erection of tall masts for hobby and commercial use. In fact, it is believed that the amendment is at least partly a result of a campaign by one local council which has had its anti-radio mast rulings overturned on appeal.

Surprisingly, the Melbourne and Metropolitan Board of Works Statutory Planning Branch drew up its proposed amendment without consulting with the WIA or other interested parties. It did reportedly approach "a couple of hams they knew", but these people apparently did not show much interest and the government planners assumed they were creating regulations with full community support.

When news of the proposed amendments leaked out, amateurs, CBers and other interested parties began an active letter and phone campaign. One CBER even gained valuable television air time by pointing out that the amendment

would be a major inconvenience to those wishing to erect antennas for television reception in marginal reception areas.

At time of going to press, MMBW planners have been saying that the proposed amendment has not yet been finalised for presentation to the local Minister for Planning. A submission has been prepared and submitted by the Victorian division of the WIA and the MMBW has promised to study it, and the numerous private submissions, before finalising their proposals.

This incident has demonstrated the value of a concerted approach to problem solving, one which should serve as a model when similar problems occur in other states. For Melbourne amateurs, the fight is not yet won. If you have not yet approached the MMBW, the Ministry for Planning or your local member, do so without delay. Support the Vic division WIA in this campaign. The matter is an important one.

## MOVING UP

CW ELECTRONICS of Brisbane has changed premises from their old location in Tarragindi to 416 Logan Road (Pacific Highway), Stones Corner (next door to the post office). CW's Managing Director Brian Beamish said that the move will offer greater convenience to clients and "permit us to demonstrate and display our goods and services to the best advantage".

"This move demonstrates our growth, which at some stages has even surprised me", stated Mr Beamish, "whereas many companies in this area, especially in radio, are pulling in their horns we see this as a prime opportunity to expand both our goods and services to the enthusiast".

For further details on CW Electronics' range of products, contact Brian Beamish on (07) 48 6601.

**ARA**

## A TOUCH OF NOSTALGIA

A RECENT Southern Peninsula Amateur Radio Club meeting in Rosebud was the venue for a lecture on The Early Days of Radio by Chris Raibow VK3JR.

The photo shows Chris demonstrating a captured World War 2-era Japanese transceiver. Other equipment on display included a Spark Transmitter tuning condenser dating from the first world war and the quaint sign, taken from an early guest house, proudly announcing their new electric lighting. The sign reads "This Room is Equipped with Edison Electric Light. Do not attempt to light with match. Simply turn key on wall by the door".

Also at the meeting, blind amateur John Haworth VK3VWP was made an honorary member of the club.



# The Amateur Radio Action NOVICE DX AWARD

HERE are details of the Amateur Radio Action Novice DX Award. Have you qualified yet? Have a look through your log book and QSL cards, you might be eligible.

## OBJECTS

- 1.1 This Award was created in order to stimulate interest in working DX by Novice Amateur stations in Australia and to give successful applicants some tangible recognition of their achievements.
- 1.2 This Award, to be known as the **NOVICE DX AWARD**, will be issued to any VK Novice Amateur station or a station operating in a previously Australian administered Territory, who satisfies the following conditions.
- 1.3 A certificate of the award will be issued to applicants who show proof of contacting all the following:
  - (a) Ten (10) countries outside Australia.
  - (b) Ten (10) prefixes from the same country outside Australia. These prefixes **MUST** be similar, starting with the same letters, e.g. W1 to W0, WA1 to WA0, WB1 to WB0, JA 1 to JA0, DJ1 to DJ0 etc. Mixed prefixes are not permitted.
  - (c) Ten (10) zones (as defined for the Worked All Zones Award Certificates will be endorsed as necessary for contacts made using only one type of emission and/or for only one band.

## REQUIREMENTS

- 2.1 Verifications are required for the stations worked. The ten countries must be listed in the AMATEUR RADIO ACTION DX COUNTRIES LIST.
- 2.2 The commencing date for this Award is September 1st, 1978. All contacts made on or after this date may be included.

## OPERATION

- 3.1 All contacts must be made with amateur stations working in the authorised amateur bands.
- 3.2 All contacts must be two-way contacts on the same band. Crossband contacts will not be allowed.
- 3.3 Contacts may be made using any authorised type of emission for the band concerned.
- 3.4 Credit may only be claimed for contacts that use regularly-assigned Government call signs for the country concerned.
- 3.5 Contacts made with ship or aircraft stations will not be allowed, but land-mobile stations may be claimed provided their specific location at the time of contact is clearly shown on the verification.
- 3.6 All stations must be contacted from the same call area by the applicant. If the applicant's call sign is changed, contacts will be allowed under the new call sign providing the applicant is still in the same call area.
- 3.7 All contacts must be made when operating in accordance with the Regulations laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations" or its successor.

## VERIFICATIONS

- 4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.
- 4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.
- 4.3 Each verification submitted must show the date and time of contact, type of

emission and frequency band used, the report and the location or address of the station at the time of contact.

- 4.4 A check list must accompany every application setting out:
  - (a) The applicant's name, address and callsign.
  - (b) The details for each claimed station in accordance with the details required in Rule 4.3.
- 4.5 In lieu of forwarding QSL cards or other written evidence as set out in rules 4.1 to 4.4 above, a list giving the details set out in Rule 4.3, certified by two licensed full-call amateurs known to the applicant should accompany each application for the Award.

## APPLICATIONS

- 5.1 Applications should be addressed to The Awards Manager, Amateur Radio Action, 250 Spencer Street, Melbourne, Vic., accompanied by the verifications and check list with sufficient postage enclosed for their return to the applicant, registration being included if required.
- 5.2 A nominal charge of \$1.00 or such other amount as may be determined from time to time, which shall also be forwarded with the application, will be made for the issue of the certificate.
- 5.3 Successful applicants will be listed in AMATEUR RADIO ACTION periodically.
- 5.4 In all cases of dispute, the decision of the Awards Manager and the Editor of AMATEUR RADIO ACTION in the interpretation and application of these Rules shall be final and binding.
- 5.5 Notwithstanding anything to the contrary in these Rules, AMATEUR RADIO ACTION reserves the right to amend them when necessary. ■



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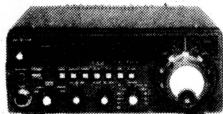
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# Readers state their opinions

# Communications.

## COOL IT

Sir,

I have been approached by people on both sides of the WIA ARA outbreak of hostilities seeking my views and looking for some conciliation or solution.

A senior member of the WIA Victorian Division asked if I could help to take the heat out of the situation and defuse any further flareups.

On the other hand, ARA maintains that it has taken enough flak from the WIA and is fed up with turning the other cheek — however it wishes that the conflict had not occurred.

Looking at the matter from an independent point of view I see the urgent need for both sides to compromise and admit that they're not entirely without blame or fault.

Let's examine the ARA side of things:

★It should make clear that any comments that its columnist 'ERIS' makes are not necessarily the views of the editor. The purpose of ERIS should be clearly stated because this column has been a source of contention due to it being misunderstood by many.

★ARA should withdraw its claim that announcers on the WIA weekly news broadcast have been banned from mentioning ARA.

This is not the whole truth.

A person who contributes to the VK3 broadcasts had been advised of concern about certain items he had put over may be seen as using the broadcast for the sale of gear and promoting a commercial publication.

This is not the same as a total ban on the mention of ARA.

★While claiming that the Department of Communications gives the WIA journal every assistance in the way of news — ARA hasn't been disadvantaged by this to any great extent.

In fact it has actually beaten the WIA into print on most occasions so this complaint isn't really valid.

★ARA appears to have some justification for its outburst. Although, its "come on have a go" retort to the WIA for it to put AR on public sale is a bit of emotional nonsense.

Now for a look at the WIA role:

★There needs to be a serious re-think by the AR editor for his comments and action in the May AR.

It's not the first time that he has made statements on how good AR is and that it's "Australia's only monthly magazine for Amateur Radio operators."

Such claims are not true.

He and everyone else must accept that there's room for both AR and ARA and the demise of either would be to the detriment

of the hobby.

★The position of AR editor has certain responsibilities and authority.

Anyone in that job who doesn't carry it out in a suitable manner should be sanctioned.

The matter of AR being available on the newstands has been officially dismissed by the Institute.

The question which needs to be clarified is whether judgement was clouded in using a whole page on a dead issue.

★Some WIA officials seem to be paranoid about the existence of ARA.

By being stagnant in their thinking they've missed a great opportunity and have done the hobby a disservice.

The WIA should be using all avenues to attract new members — including the pages of ARA.

Many would-be amateurs and non-WIA members read this magazine and with a little imagination the Institute could be attracting these people.

ARA had offered the WIA a free page in each edition but the Institute was sluggish in responding.

Can the WIA afford to ignore an opportunity like this?

★Initially the WIA hierarchy seems to be closing ranks as if endorsing the conflict.

It will be for WIA Divisional Councils and individual members to judge whether this is in their best interests.

Conclusion:

The WIA and ARA must 'cool it' and work together or separately for the betterment of the "friendly" hobby.

Jim Linton  
VK3VKC/VK3PC

**Jim Linton is a writer and amateur whose contributions appear regularly in ARA. — Ed.**

## A BOMB DROPPED?

Dear Sir,

The Newcastle region is still recovering from the bomb dropped by the WIA VK2 division's removal of the QSL bureau from Teralba to Sydney. I am disgusted at the suddenness and secrecy with which the move was attempted.

The repercussions are tremendous and it seems "The Heavies" at Atchison Street have no idea of what is involved.

Do they really believe someone will volunteer to take up to ten thousand cards per week home and sort them in their lounge room?

Will the new QSL Officer be forced to pay outwards postage from his/her own pocket before claiming expenses from the WIA, or will he be given a "float"?

I cannot imagine up to twenty Sydney amateurs turning up at Atchison Street to

sort QSL cards every Friday, as the Newcastle team has done for many years. I imagine the chaos that will result with worldwide QSL mail still being sent to Teralba! We all know how many years it takes to re-educate the DX world to address changes. Unfortunately it only takes Australia Post twelve months before they stop re-directing mail.

What a prospect — the long awaited shipment of cards arrives from Moscow at last, to bring great joy to the eager who have waited so long to have the various Soviets confirmed. But all to no avail — the parcel is returned to sender!

VK2 will join the ranks of the South American Banana republics in the world of QSL Bureaux.

Mr Bill Hall did a fantastic job as VK2 QSL Officer and I believe Atchison Street is capable only of turning his work into chaos — not improving it!

Westlakes Radio Club have made a submission to have the bureau transferred "down the road" from the existing building to their club rooms and there is no doubt they would make a good show of the job.

Most of the regulars who helped at the old bureau would go to Westlakes, as would I and I am not a member of that club. Further, no re-direction of mail would be required as Teralba would continue as the Post Office concerned.

I only hope Atchison Street has the sense to accept the Westlakes proposal and maintain continuity of the QSL bureau junction or be otherwise prepared for a very interesting Annual General Meeting next year when elections come around.

Philip Greentree  
VK2DPN

## FROM A PIRATE

Sir,

Regarding communications and Eris Vol. 3, No. 11 it seems to be a mystery to both Hams, CBers, and the dreaded pirates as to what has happened to the great influx of newcomers, maybe not so much for the pirates. The great mystery lies in the following facts: —

- (i) ham equipment isn't cheap
- (ii) there are not enough legal frequencies available
- (iii) the attitude of the P&T commission to revising the W&T act
- (iv) the cost and time involved in licencing

Therefore, most newcomers are to be found "wandering" between 24 MHz & 28 MHz, owing to the modify-ability of O2 a CB sets to this spectrum.

Yours Piratingly  
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**ARA**

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Netronics 463232  
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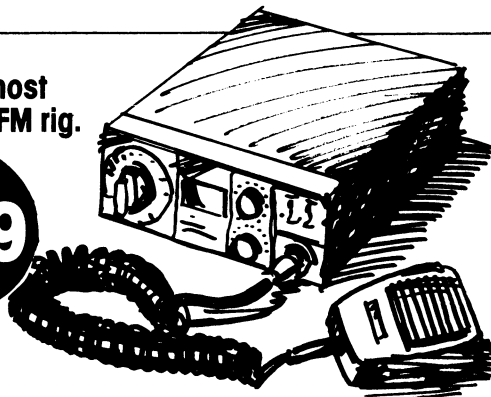
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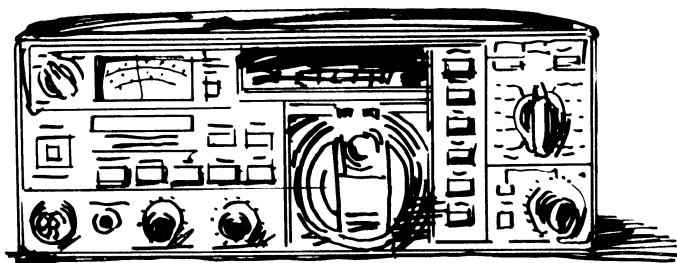
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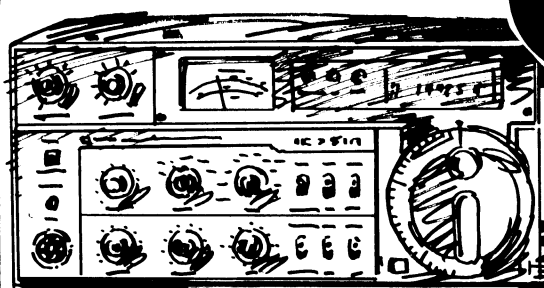
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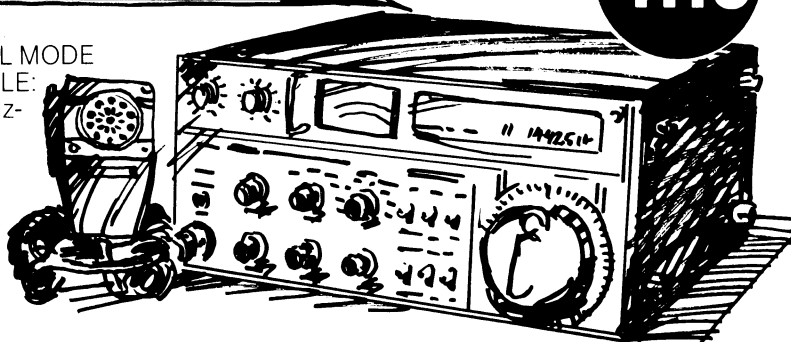


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# Equipment Review



New kid  
on the  
block

There has always been a certain magic associated with handheld transceivers. The ability to pick up your station and take it with you when you leave the shack or car is enough to grab the imagination of even the most jaded operators. With the widespread use of two metre FM repeaters the small handheld has really come into its own on this band. The number of available models continues to grow, ranging from simple 'bare bones' sets with several crystal locked channels to sophisticated microprocessor controlled models with PLL channel selection, memories, special repeater offset capabilities, and more.

Until recently the Australian market for handheld transceivers has been dominated by the larger Japanese manufacturers selling through their established dealer networks. The smaller, lesser known brands have failed to make an impact — not through product short-comings, but simply because they lacked sufficient promotion.

Emona Electronics, through their retail division Emtronics, are attempting to change this. They are now importing the T-1200, a sophisticated two metre handheld manufactured by the Japanese firm Sanwa Electric Engineering. Rudi Breznik, proprietor of Emona, recently supplied a T-1200 for our appraisal.

The T-1200 comes carefully packaged and the new owner is supplied with everything needed to get on the air immediately. Included in the box are the transceiver itself, a flexible "rubber duckie" type antenna, a 9.6 volt nicad battery pack, charger and a small earpiece for private monitoring. The transceiver is fitted with a small wrist strap, although a soft leather case is one of the optional accessories. Other accessories include an external speaker/microphone, a variety of antennas and a converter to supply 9.6 volts to the radio from a standard 12 volt auto lighter socket.

Manufacturing quality and finish of the T-1200 are of a high standard, with the large number of controls sensibly placed for easy use. Frequency setting is by way of a push button pad located on the front of the radio, with frequency display via an easy-to-read LED readout located immediately above. The four by four matrix of push buttons also controls memory programming and selection, scanning, and display blanking. With an optional tone calling unit (not normally available in Australia) it also provides a range of tone control signals on transmit.

Beneath the frequency select push buttons are a total of six slide switches. These are used to select the various scanning modes, simplex or duplex operation (along with the desired repeater offset), automatic display blanking (if desired), and memory or keyboard frequency selection. Also featured on the front panel are the red transmit and green receive LEDs.

On top of the radio are the antenna socket, volume and squelch controls, earphone socket, another socket for mounting the op-



tional speaker/mic and the transmit power select switch. This is a three position slide switch labelled 'High-Low-Reset'.

The High and Low positions are fairly self-explanatory, but some mention of the reset function is perhaps in order.

Upon first application of power (say when replacing the battery, or after recharging) internal programming automatically loads a variety of frequencies into the ten memories positions. These frequencies may then be altered by the user as desired.

Once the memories are loaded, the T-1200 will preserve the selected frequencies until either the battery pack is unplugged or the power select switch is switched to reset, at which time the memories are reprogrammed to the startup frequencies.

To preserve the memories a small current — a couple of milliamps — must be drawn from the battery even when the set is switched off. If you wish to use the T-1200 in situations where low power consumption is a must, say when backpacking, simply set the power selection switch to 'Reset' and switch the radio off when not in use. Just don't forget to set the switch back to 'High' or 'Low' power when you wish to transmit!

The scanning functions proved very popular with ARA staff. There are a variety of ways this may be implemented.

The first decision to be made is whether to scan the entire band, a portion of the band or the preset memory positions. If you wish to scan the entire band, the FREQ-MEM switch is set to FREQ and the UP or DN Push buttons are pushed to start scanning. The SCAN switch is used to select automatic or manual scanning. The third position on this switch is a dial lock, but more on this later.

The scan stepping rate is initially set at 5kHz per step. This may be increased in 5 kHz steps up to a maximum of 100 kHz per step. The SCAN-SRCH switch then determines whether the scanner stops once a busy channel is found or continues after the traffic is complete. Just a little extra, but a nice touch.

If only a portion of the band is to be scanned, the starting point must first be loaded into the keyboard and the UP or DN keys pushed as required. Unfortunately, it is not possible to specify both high and low edges, which in practice means you must scan right from the starting point to the end of the band on each 'pass'. We would have preferred to see presettable high and low band edges, just to make the package complete.

To scan the ten memory locations, the FREQ-MEM switch is placed in the MEM location and the UP or DN button pushed to start scanning. If you do not have ten frequencies you wish to monitor, it is simple to 'double up' on a few locations to ensure the desired frequencies are covered.

By way of example, the reviewer wanted to check two Melbourne area repeaters, so he loaded each frequency in alternate memory locations. This is easier to do than it sounds. Simply set the slide switch to

FREQ, select the first frequency and push SET. Set the slide switch to MEM and the push MWV-M1-MW-M3-MW, etc. Go back to FREQ and repeat the procedure for the second frequency. It is actually faster to do than it is describe.

Once repeater frequencies are selected, there arises the question of the proper offset. The SPX-DPX switch determines if the transmit frequency is to be offset, the switch below that then determines by how much. The standard  $\pm 600$  kHz are selected by setting the three position switch to the correct position. In the centre position the transmit frequency is actually the frequency stored in the M1 location. This is easy to set up and takes care of those strange offsets sometimes encountered (perhaps on a quick trip across to ZL, where conversion to 600 kHz is still not complete).

The only other slide switch to be described is the DISP switch, which is used to blank the display to conserve battery power (after all, those LEDs are notoriously hungry beasts). When switched to ON, the display

“  
... one can only marvel at  
what the presence of a dedi-  
cated four-bit microprocessor  
can do for a conventional  
transceiver.”

does not go out, in the AUTO position the display will blank several seconds after each over. Pushing the DISP button on the keyboard will show the frequency in use if the screen is blanked.

Unfortunately, when using the scanner the display will not extinguish. Although this probably does not drastically shorten battery life, again it would have been nice to be able to shut off the display just to complete the package.

Well, so much for all the 'whistles and bells'. As with any radio the on-air performance is what counts. The T-1200 was used in a suburban environment for some time and generally gave a very good account of itself. It is not the smallest handheld available on the market, but it is light weight and fits comfortably in the hand. Although we did not try the optional speaker/mic, after some time walking around it was decided that attaching the radio to a belt and using the remote mic would have been nice.

The 'rubber-duckie' antenna gave a good account of itself, although it was rather sensitive to detuning when the tip was near large objects. During base station operation we substituted a mast-mounted quarter-

wave ground plane which, because of its location improved things considerably. The antenna socket on the T-1200 is a conventional BNC fitting so antenna changing is an easy task.

Although not intended for DXing, we found the T-1200 to have a sensitive receiver, with no tendency to intermod distortion. It must be admitted that it was not operated in an area with a large two metre population but for the sort of jobs a handheld is usually called upon to perform the T-1200 should give a good account of itself. Frequency setting, scanning and memory loading are all easy and fast.

Recovered audio had a good quality and there is bags of volume to spare.

The transmitter earns equally good marks, with most reports rating recovered audio as good. Power specs were easily met and operating around properly shielded domestic appliances, televisions, etc. produced no noticeable interference. Once operation of the various switches and pushbuttons is mastered selecting a frequency and operation becomes a breeze, while frequency accuracy was good across the band.

Just in case you are worried about bumping something while on 'walkabout', the third position on the SCAN switch (top right-hand switch) features a LOCK function to protect previously selected settings. This comes in handy when climbing on and off trams or buses, getting into your car, or if you are prone to idle button-pushing when bored.

One reservation we did have concerns the material used for the plastic case. A warning in the owner's manual (which, by the way, is rather plain but contains all the necessary information — including a block diagram and a complete schematic) cautions against exposing the case to heat, as this might warp.

Although we did not have any problems (it is winter in Melbourne) car interior temperatures can soar in the summer, especially in the northern states. Probably keeping the radio out of direct sunlight, perhaps under the seat, when unattended would suffice. The unfortunate presence of 'light-fingered' elements in our society makes this a good idea anyways.

In summing up, one can only marvel at what the presence of a dedicated four-bit microprocessor can do for a conventional transceiver. Although the presence of all the above scanning, memory and frequency synthesis functions in a conventional size radio is almost taken for granted today, one must still be impressed when they turn up in a package which can fit in a good sized pocket.

Except for two or three little points, as noted above, the T-1200 is basically a well-engineered design, worthy of consideration if you are in the market for a new radio. At a price of \$339 it is not cheap, but it is certainly competitive with the 'big boys'. We suspect that quite a few will be turning up on two metres in the months to come.

We would like to thank Rudi Breznik from Emona Electronics, 649 George Street, Sydney, for supplying the rig for review.

ARA



# INTRUDER WATCH -you can help

by Jim Linton VK3VKC/VK3PC.

Intruder Watching is something that every active and adequately equipped amateur and SWL can do to counteract commercial and government stations that intentionally or otherwise intrude into the exclusive HF Amateur bands.

Intruder Watch operations began in Australia in 1967 with David Wardlaw VK3ADW the first co-ordinator.

After establishing the service he handed the job of WIA Intruder Watch co-ordinator to Alf Chandler VK3LC in 1969.

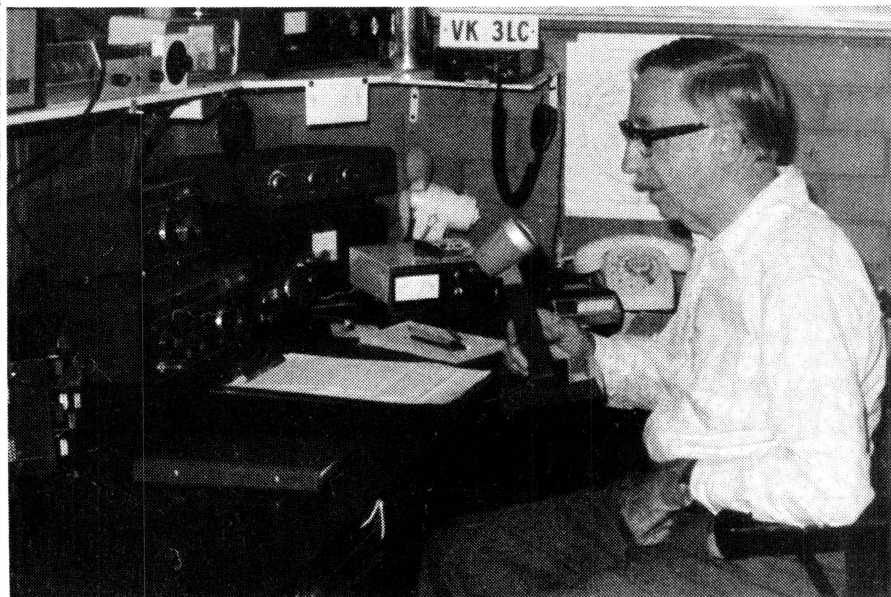
Alf has recently relinquished this position but remains the International Amateur Radio Union Region 3 co-ordinator. This makes him responsible for Intruder Watch reports in Australia, New Zealand, Southeast Asia, Japan and all Pacific areas.

Alf would welcome potential Intruder Watchers from any country in his area of control.

He gathers reports from the region and compiles a monthly summary. These are forwarded to IARU Intruder Watch Headquarters in England where they're collated with other summaries and re-distributed.

One of the ironies of Intruder Watching is that amateurs are forced to adopt a policing

**Alf Chandler, VK3LC, pictured at the controls of his neat 'Intruder watch' shack in the Melbourne suburb of Beaumaris.**



role for their bands which have been allocated on an exclusive basis — when this should really be the job of radio administrations. These administrations, including Australia's DOC don't look for intruders and are mostly unwilling to complain to the administration of the country in which the intruder is transmitting.

Despite this obstacle IW has been able to get many intruders to QSY. As Alf Chandler explains "the main reason we've got people out of the bands isn't through DOC, but through direct approach to the stations concerned. DOC has to monitor any intruders that we report to them and has to make sure that what we say is accurate before they will make a complaint."

As mentioned previously in ARA, Alf and several other amateurs in VK & ZL were able to get the "Radio of the Koran" in Saudi Arabia to QSY from 21.435 MHz. This was done by writing directly to station management. British amateurs have also recently been successful in moving Radio Cairo from 7050 kHz by using the same "direct approach" method.

What does DOC need before it will act against intruders?

"We need absolute positive identification. It has to be monitored by our own monitoring stations and without this we cannot act," is what a DOC officer said recently.

It's obvious that without Intruder Watch our bands would gradually be taken over by intruders. The service has a small group of active members throughout Australia and New Zealand — but more observers are needed.

There are presently Intruder Watch co-ordinators in most states, the Northern Territory, New Zealand, and a Federal co-ordinator. All welcome inquiries about the service. A weekly net is held on 3540 kHz each Thursday at 2030 AEST.

Alf Chandler also keeps regular skeds with K6KA in Los Angeles (28.555 MHz, 0900 AEST, Wednesdays), ZL1BAD (14.165 MHz, 0800 AEST, Thursdays), and G5XB (14.270 MHz, 1715 AEST Mondays) to exchange reports on intruders.

When logging a suspected intruder, make sure you note the date, time, frequency and mode. Special report forms are available from co-ordinators for this purpose.

Alf says "the mode is very important — most amateurs aren't conversant with all of the modes.

"I have an identification tape with examples of most of the modes which can be supplied on request." This tape can be obtained by sending Alf a blank tape or cassette and a self-addressed envelope.

## USSR CODE

The Russian Code employs most of the familiar Morse character sequences.

Russian Letter	Morse Symbol		
А	..	А	П ---- P
Б	----	В	Р --- R
В	---	С	... S
Г	---	Т	- T
Д	---	У	... U
Е,З	.	Ф	---- F
Ж	----	Х	.... H
З	----	Ц	---- TS
И	..	Ч	---- CH
Й	----	Ш	---- SH
К	---	Щ	---- SHCH
Л	----	Ъ,Ь	---- Mute
М	--	Ы	---- I
Н	--	Ю	---- YU
О	---	Я	---- YA

Most broadcast and government stations are identified by their callsigns which are required under international radio regulations. Those who don't use callsigns can be identified by other means, such as their operating procedure. For example, Russians use the Cyrillic Alphabet, Japanese the Kata Kana code, and Chinese procedural two-letter groups instead of the Q-code.

With the increased availability of computerised RTTY equipment and surplus teleprinters intruder watchers have recently been able to more easily identify radio-tele-type intrusions. Broadcasters are usually not hard to identify because they often use a distinctive tune at the commencement of transmission or have an opening station announcement.

Alf Chandler says that someone who hears a broadcaster in an exclusive amateur segment could take some time listening to get the start of transmission and the station's identity.

One frequent broadcast intruder is Radio Peking on several frequencies in the 7 MHz band. Unfortunately, this station doesn't take the hint when sent a complaint of intrusion by an intruder watch observer.

"They'll send a nice QSL card and often a calendar," said Alf.

However Alf and his persistent Intruder Watch team aren't giving up and the Foreign Affairs Department has been asked to help get the message to Radio Peking that it's broadcasting where it has no right to be.

Some intrusions are the result of harmo-

A	KA	SA	TA	NA	HA	MA	YA	RA	WA
ア	カ	サ	タ	ナ	ハ	マ	ヤ	ラ	ワ
I	KI	SI	TI	NI	HI	MI	I	RI	(W)I
イ	キ	シ	チ	ニ	ヒ	ミ	イ	リ	キ
U	KU	SU	TU	NU	HU	MU	YU	RU	U
ウ	ク	ス	ツ	ヌ	フ	ム	ユ	ル	ウ
E	KE	SE	TE	NE	HE	ME	E	RE	(W)E
エ	ケ	セ	テ	ネ	ヘ	メ	エ	レ	エ
O	KO	SO	TO	NO	HO	MO	YO	RO	WO
オ	コ	ソ	ト	ノ	ホ	モ	ヨ	ロ	ワ
N	NIDON	MAN-NIDON	NYNEN	PERIOD	BRACKETS	QUOTE	PARAGRAPH	QUESTION MARK	
ン	ニド	マンニド	ニン	ピ	( )	" "	¶	?	

### JAPANESE 'MORSE' CODE (sometime called Kata Kana Radio Code)

The Japanese Code contains a number of character sequences not found in the standard International Morse Code. These unusual character arrays may be helpful in identifying the origin of unknown transmissions.

tics and spurious radiations. "If you get in touch with the station engineer in such cases they'll very often do something about it because such radiations, if they are very potent, will take a certain amount of power away from the fundamental frequency," explained Alf Chandler. He points out that broadcast intrusions on 28 MHz are mostly harmonics

of stations on 9 MHz and 14 MHz.

The Intruder Watch does not become involved with complaints about unlicensed operation or CB-type intrusions on 28 MHz. Anyone wishing to have action taken against these pirates will have to complain directly to their local DOC radio inspector.

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 Frank Gardiner,  
 1 Pine St., KINGLAKE 3763.

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ARA

# COMPUTERISED RTTY

## "MACROTRONICS AND THE SYSTEM 80"

by Ron Collins VK5RY

Let me begin by pointing out that I am not an "expert" on RTTY, or anything else for that matter. This article is to let others know of my observations in regard to the Dick Smith System 80 computer used with the Macrotronics M80 interface for RTTY operation.

I have been involved with RTTY for about seven years; my main interest being DX and Contest operating. Just recently it has become apparent that a lot of stations in the United States and Europe are using equipment that is computer controlled. When asked what is their equipment, a large number answer, "such and such a micro-computer" with a "M800 RTTY interface".

Having toyed with the idea of applying the same idea here, I investigated the cost of various computers, but found them mostly to be cost-prohibitive — for me anyway. Then, lo and behold, the System 80 was released and put micro-computing within my grasp. I purchased one and 'played' with same for a few weeks.

Now, I thought, the time was ripe to sound out the possibilities of RTTY. I wrote to "Macrotronics" in the States, giving the pinout of the SYSTEM 80, to see if it was compatible with the Tandy-80 version of the M800. The reply was, "if it is the same as the TRS 80, it will work".

According to the information I had to hand about the SYSTEM 80, there should have been no reason why the Macrotronics gear would not work, so I ordered a M80. This is the heart of the M800 system consisting of a well designed PCB and the software to get on RTTY. Also included is a comprehensive applications booklet. The cost in Australia is

a bit high at \$180 odd, but if the price of a unit ordered from U.S.A. plus the import duty etc. is taken into consideration, I suppose it is not too bad.

Then came the 'crunch'.

Looking at the connections between the TRS-80 and the M80, the requirements are: 4 address lines (0-3).

4 data connections (0-3).

A ground

and a "funny" called "Not IN".

I supposed that a "Not IN" would be an "OUT", but there was no output on the SYSTEM 80 called either of these names. Checking with the TRS-80 service manual. I found the missing line was in fact a combination of "Not RD" and "Not IORQ", being Read Bar and IN/OUT Request Bar, the two being combined in a gate to give a resultant "Not IN" at the output.

Checking the SYSTEM 80 circuit diagram, it was found that the signal was in fact available, but not brought out to a pin on the connector. It is used internally for another function. Therefore, it is only a matter of joining pin 6 of IC15 (74LS32), (See Fig. 1), to unused pin 32, on the top of the edge connector, with about two inches of hook-up wire, and the necessary "Not In" function is provided.

Having connected up the address and data lines and not in connections, along with a ground and 9 volts AC the "thing" is up and running after loading the program from the cassette supplied. Well, it's not quite that simple. After reading the loading instructions it becomes obvious an instruction named "Memory size" is required.

"Memory size"? what's that? What I did

know at that time, was the "READY" that appears on the screen when the SYSTEM 80 is first switched on is in fact a request from the computer to tell it what memory size is required.

Switch off SYSTEM 80, switch on again and after 15 seconds, up comes 'READY?'. Type in 3000 — as per the instructions in the booklet — type 'NEW-LINE' and the READY pops down to the bottom.

Type SYSTEM, it answers with a ?; type M80, press the cassette 'play' button and then the "NEW-LINE" key and the cassette begins to load with the flashing asterisk.

The first load is in machine language and when completed a "?" will appear.

Press the "BREAK" key, then type the CLOAD command, and the cassette will begin to load the BASIC part of the programme. The normal "Ready?" will show that the programme is in memory and we can now "Run" the programme.

At first there is displayed the name of the programme and the author, then the screen is blanked just prior to display of the operating instructions. They tell you what to do and when to do it, however, to get out of one mode and into another a function called a "CLEAR" is required. What is a "CLEAR?" you might well ask, because the early System 80s haven't got one — no matter how hard you press all the other keys. The System 80 circuit has the same keyboard matrix as the TRS-80, but some keys have been omitted from the System 80 for some unknown reason. Also, another function is required and is the "forward arrow" which is used to alter some of the mode activities of the programme.



From all outward appearances there seems to be plenty of space in which to mount the necessary extra keys. In reality, the task is virtually impossible because internal room is minimal. For the "CLEAR" key, I made use of the right hand "SHIFT" key; just by cutting the PCB foil and connecting to the right points.

Ha, you will say, that's easy. But did you know the connector pins labelled 1 to 20 are in fact reversed. Pin 20 becomes pin 1 and vice versa.

If you were dumb enough to flop the keyboard over from right to left — as I was — to get to the underside of the PCB you will now be aware that all the wires plugged into the connector on top of the boards have fallen out. The trick is to flop the PCB over from front to back and they will stay in place — hopefully.

While looking at the bottom of the PCB why not access the rest of the unused lines.

Apart from "CLEAR", there are six other function keys that might as well be connected — see Fig. 2. A few "low profile" keyswitches were obtained and mounted on a piece of fibreglass with a second piece attached underneath for insulation. The new assembly was mounted as a 'next' row up from the existing top row — but this of course is up to the individual.

Now we can really get going. Connect up the TS820 and the DT600, follow the "MENU" and get on the air.

What?, no receive of RTTY characters?.

Upon checking with a logic probe, it was found that the EX/OR gates in IC9 on the M80 board were not switching, even with 0-5V transitions on the input (H) and (7), (RS232 in). Changing the OPTO load resistor to 500 ohms from 1k cured this problem and incoming signals were rushing characters onto the TV screen. But, it was all "Gibberish". What's up now? On checking the Menu it was found that pressing the '/' key, inverts the 'marks' and 'spaces' and to my delight the system was 'up' and operating.

I have yet to try the "THING" on CW but messing about with the keyboard in the CW mode makes transmitting a breeze and the 'buffer' makes typing ahead very easy.

For further information on the System 80, there are some "News Letters" (numbers 12 and 17) available from Dick Smith's shops for free.

I might just get DXCC on RTTY yet. In the Keyboard Matrix, (Fig 2), note the extra characters.

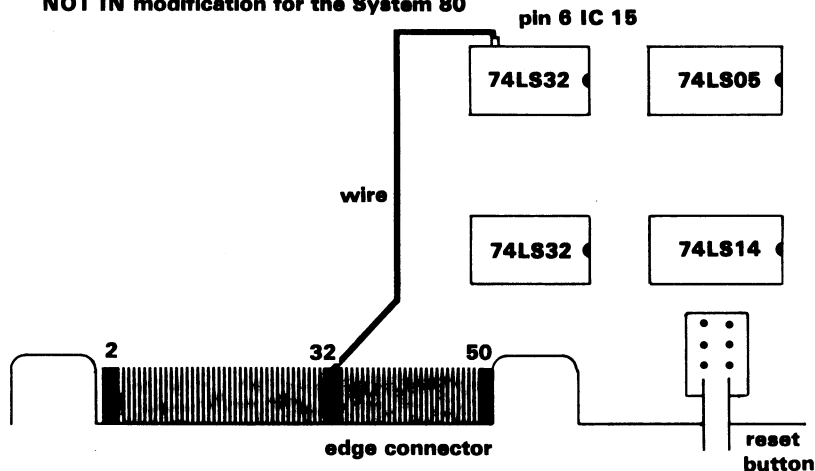
Lines: —

- 3-16 Left Square Bracket
- 1-16 Back Slash
- 5-16 Right Square Bracket
- 2-16 Inverted Vee
- 4-16 Underline
- 8-19 Clear
- 2-19 Advance Arrow (Actually "Tab 16 Characters").

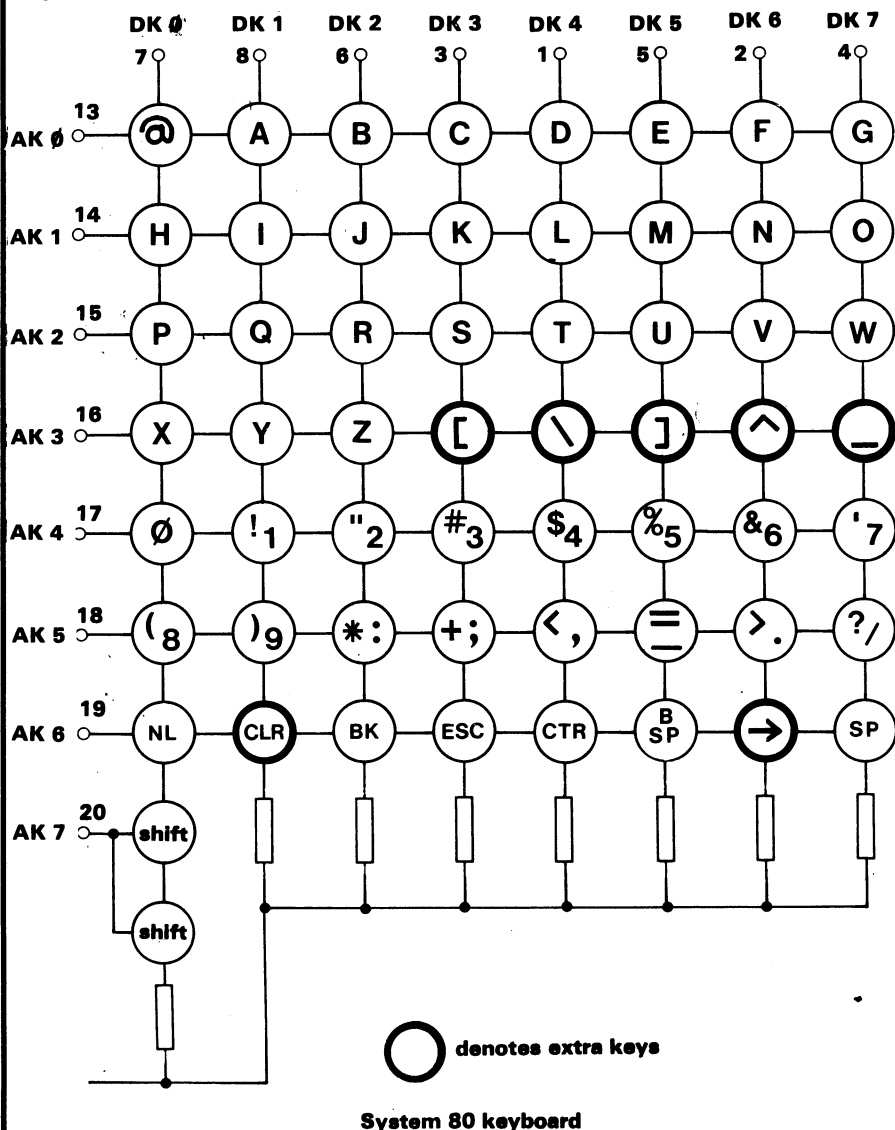
Line 20 to any other line only duplicates other characters.

**A R A**

**Fig. 1. IN NOT IN modification for the System 80**



**Fig. 2**



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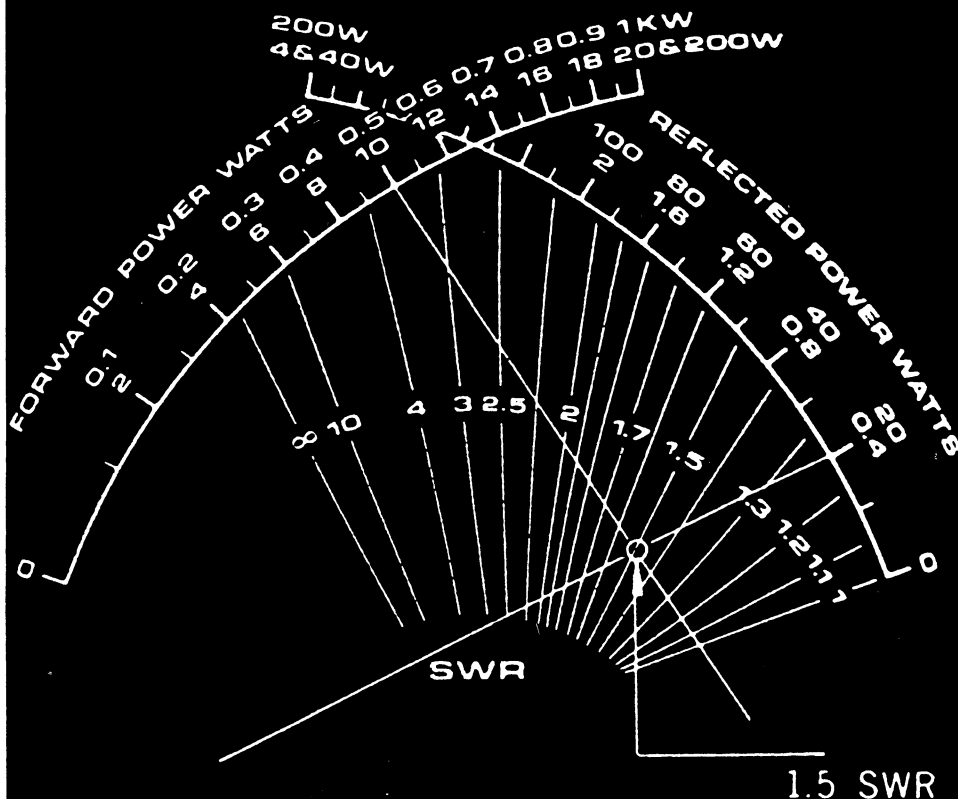
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# VIDEO RECORDING TECHNIQUES

## The first of a series of articles on Video Recording formats by Ken Bull VK3NJ

Probably the most important item of ancillary equipment for today's ATVer is a video recorder. With it he can record his own ATV transmissions for later assessment, or the transmission of fellow amateurs for immediate rebroadcast. A video recorder also provides a versatile alternate program source to a TV camera or test pattern generator. Most important of all, he can record his favorite TV program for the repeated enjoyment of his family or to assure they do not miss a much waited for TV show which happens to be broadcast on the same day that he promised to take them on a field day excursion. And of course, since he probably already has a TV camera, *home movies* now become *home video*.

As the price of various recorders is now within the range that can be afforded by a large number of amateurs we have decided to run a series of articles on the various video recording formats currently available and on the theory and technicalities in general. In this issue we will concentrate on the history and development and examine briefly the various formats available.

## THE EARLY DAYS

Although we are about to enter an age where video signals can be recorded onto a disc in the form of physical undulations of the disc material — isn't this where Edison started with sound? — up until now video has been recorded *magnetically* on tape, disc, or wire. The world's first device to record an analogue signal magnetically was the *Telegraphone* of Poulsen. This was in Denmark in 1898. Eight years later Poulsen patented the use of DC bias which he found reduced the distortion and the noise on the recorded signal. It was not until 1927 that the use of high frequency AC bias was developed by Carlson and Carpenter in the USA which of course is the system used today in the recording of audio signals.

AC bias makes possible the very low distortion and high signal to noise ratios required of modern recorders.

In order to appreciate some of the problems encountered in recording video it is worth looking at the function of bias. Fig. 1a shows the *transfer characteristic* of a typical magnetic recording tape — i.e. the relationship between the input signal to the record head and the resulting flux density produced on the tape. This characteristic is derived from the familiar *hysteresis* curve of a magnetic material. In order to avoid distortion, the input signal (A) to the record head must be small; therefore, the signal recorded on tape (B) has a very low level re-

sulting in a poor signal to noise ratio. If the input signal was increased in level, (Fig. 1c) then severe distortion would result due to the non linear centre portion of the characteristic DC bias, used on some cheap and nasty recorders shifts the input signal onto a linear section of the curve, (Fig. 1d) but although this reduces distortion because all of the magnetic particles are aligned in one direction, a high noise level still predominates.

Fig. 1e shows the effect of using high frequency AC bias. A bias of about 5 times the highest audio frequency is added to the audio input signal. The key word is *added* — modulation does not take place. The magnetisation properties of the tape prevent retention of the high frequency bias signal because of such factors as particle size, tape speed, and head gap size — thus the tape is left magnetised to an *average* of the input signal. This average is a theoretically undistorted version of the audio input signal. Optimisation of distortion and noise is thus achieved. For a typical audio recorder the bias frequency is 100 kHz.

Getting back to history. In 1935 the Germans produced the world's first *tape* recorder — recording to that date had been on iron or steel wire. Tape recording achieved a high degree of fidelity in Germany during the war and this was further developed by the allies after the conflict.

Although TV transmissions had begun in England and America before the war, regular broadcasts were resumed and methods of recording video information were investigated. It must be appreciated that while the highest audio frequency is around 20 kHz, a video recorder would have to handle frequencies up to 4 or 5 MHz. This of course excludes slow scan and low definition systems. In fact, low definition pictures had been recorded on gramophone records in the early 1930s but this involved frequencies up to 10 kHz or so. To record 5 MHz was a *different* matter.

In order to record the semblance of a sine wave, the very minimum of four successive magnetic particles must pass under the influence of the record head throughout one cycle. Given the achievable size of tape particles and the size of the flux gap in the record and replay head, then very high tape speed is a necessity. This fact can be appreciated by realizing that only a few years ago a tape running at  $3\frac{1}{4}$  inches per second offered an audio response to only about 10 kHz. To achieve 20 kHz, the tape speed had to be increased to  $7\frac{1}{2}$  inches per second. Of course modern technology applied to the size of head gaps and tape particles has improved on these figures, but it can be appre-

ciated that to record 5 MHz requires a very high head to tape velocity.

Early video recorders used very high *linear* tape speeds. In the mid 1950s the BBC's VERA used  $\frac{1}{4}$  inch tape running at 200 inches per second. This had 3 tracks — one for direct video, one for video below 100 kHz, and one for audio — which was frequency modulated onto a carrier. Supply and take up reels were by necessity quite large. Meanwhile in the United States the large TV networks which invested large sums in live variety shows, were concerned about the time difference in their presentation across the continent of the USA. An investigation into the development of a practical video recorder was instigated in order to provide a time delay from East to West coast in the presentation of these shows.

In 1956 the Ampex company produced the first *transverse scan* or *quadruplex* video recorder. In order to achieve the required tape-to-head speed, instead of high linear tape velocity, rotating heads were used scanning a 90° to the direction of tape travel. Figure 2 shows the typical head layout of a quad machine. Tape width is 2 inches and its speed is 15.625 inches per second in the 625 line standard. The head drum revolves at 15,000 revs per minute. Audio, and a cue track for miscellaneous cues, etc. are recorded longitudinally, as is a control track which is necessary to maintain synchronism between the head drum motor and the linear tape speed during replay.

The original machines recorded and replayed broadcast quality monochrome, but by 1957 RCA had produced a colour recorder using the same format. Quad machines, while providing excellent quality pictures were very large and expensive. It was the Japanese who first developed a video recorder which would be suitable for the domestic and semi-professional market. The Toshiba company produced the first *helical* scan recorder in 1959.

## THE HELICALS

Although various helical scan machines differ in size of the head drum, number of heads, head drum speed and direction of rotation, tape size and tape speed, all work on basically the same principle which can be seen in fig 3. The tape is guided over a spinning head drum at such an angle that the resulting video tracks recorded on the tape are long diagonal lines. As on quad machines, audio and control tracks are recorded longitudinally. Each long video track can contain more information than the shorter track of a quad tape. For instance, while a track from a quad tape usually contains 15



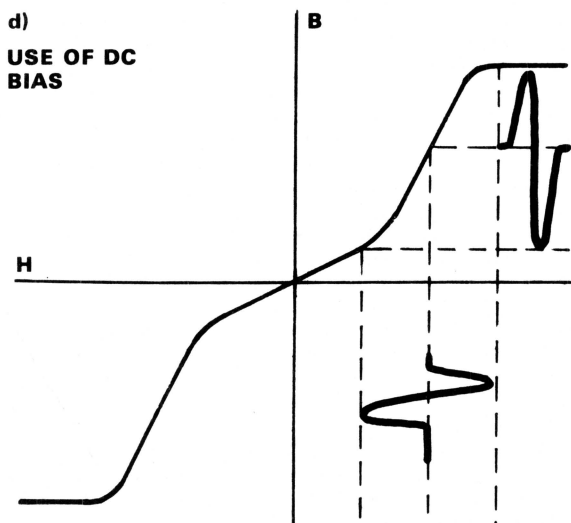
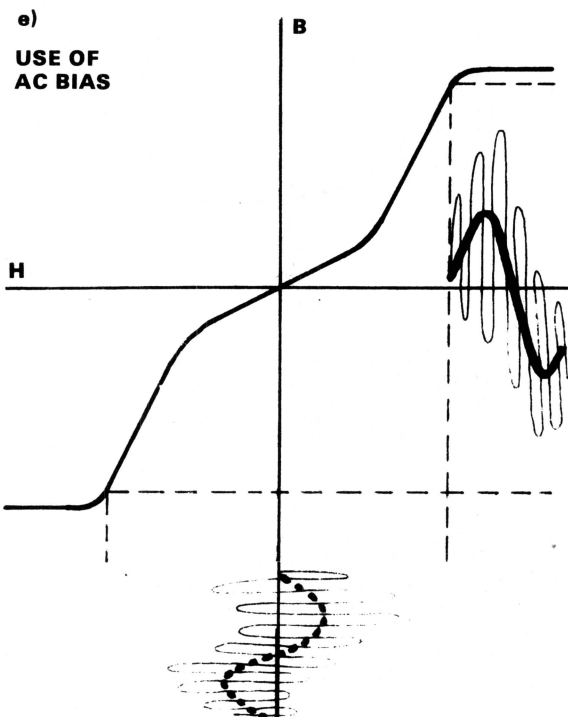
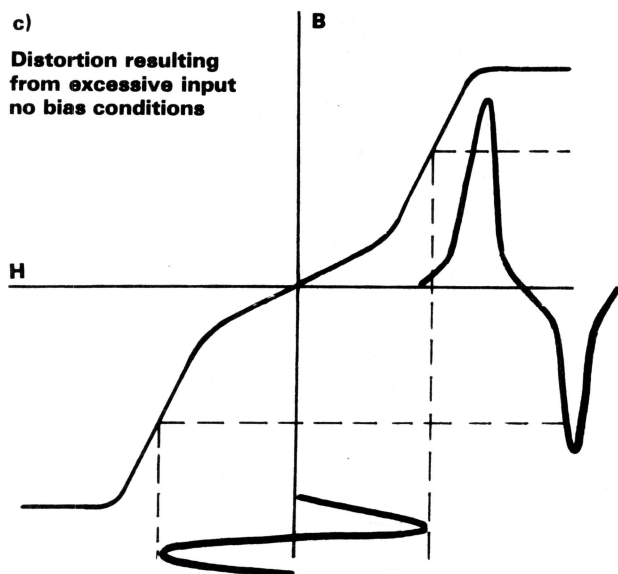
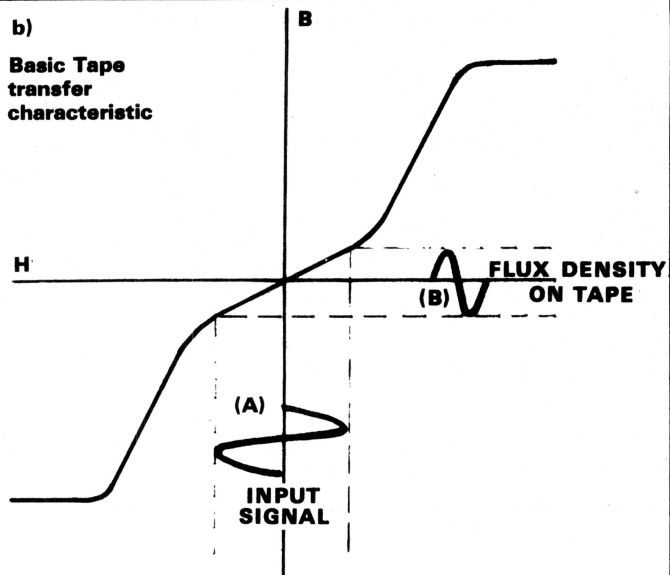
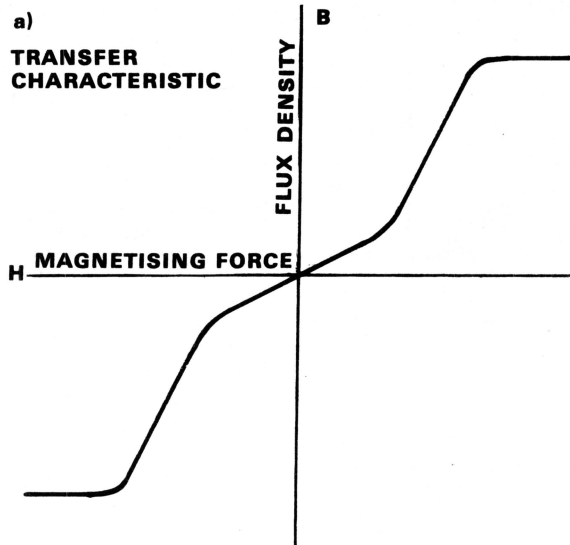


Fig. 1 — These diagrams show basic tape transfer characteristics, as well as the effect of both DC and AC bias.

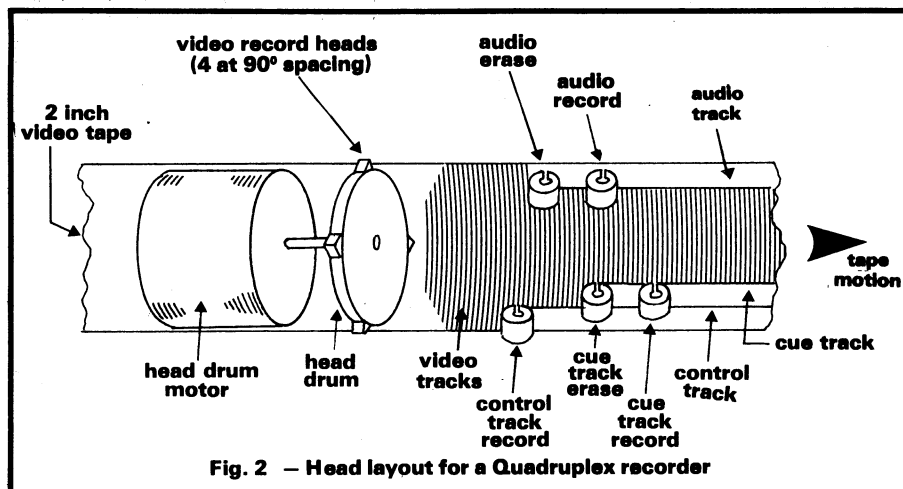


Fig. 2 — Head layout for a Quadruplex recorder

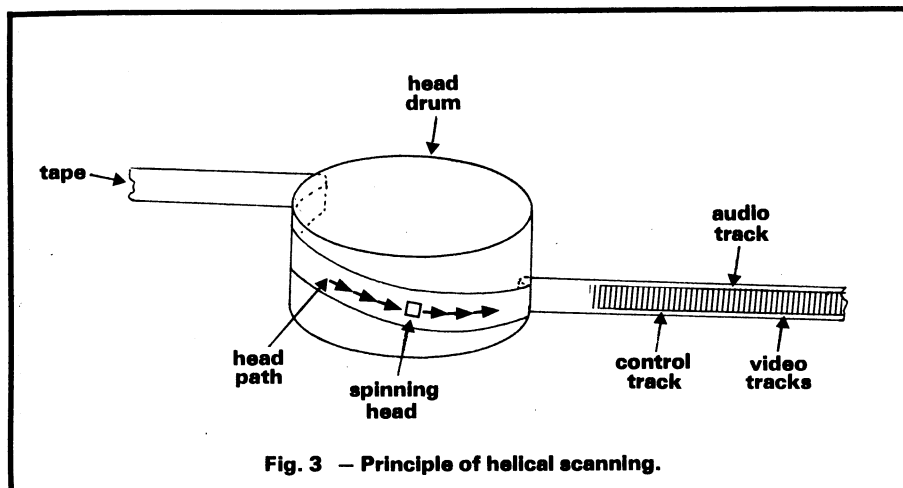


Fig. 3 — Principle of helical scanning.

priced cassette. Their machine was based on the successful  $\frac{3}{4}$  inch U-matic system. The main feature of Betamax is the elimination of guard bands (more on this later) giving greatly increased video packaging density on the tape. JVC countered with a 2 hour VHS (Video Home System) machine using a similar but not compatible cassette running at reduced speed. Sony re-countered with a 2 hour version of Betamax. (Incidentally, the word "Beta" should be pronounced like the Greek letter to which it refers and NOT "better").

In the USA today there are 1, 2, and 4 hour versions of both Beta and VHS machines and a 6 hour long play VHS machine has just been released. Picture quality on the longer playing models is somewhat of a compromise.

PAL or European/Australian standard machines first appeared in 1978 — mercifully in single speed standards. Both have around 3 hours of recording time, although thinner based longer play tapes are now available for both of these formats extending the time to 4 hours. All domestic cassette machines feature drop-out compensation which is essential with the high tape packaging density now employed. Built-in timers, tuners, and RF outputs are standard features.

During this time Phillips produced a  $2\frac{1}{2}$  hour version of their original VCR, the NV1700. Grundig, using the same cassette produced a 6 hour incompatible machine. Production has now ceased on each of these formats; however both companies using a brand new format — a turnover  $\frac{1}{2}$  inch cassette — have introduced yet another standard to the domestic user — the 2000 series. These machines give 4 hours a side for each cassette and feature piezo-electric automatic tracking. Today, manufacturers of each format are trying to capture the market with such features as still frame, slow motion, fast motion, fast search, multi programmable timers and cordless remote controls, etc. All machines give reasonably good picture and sound quality — certainly sufficient for their intended use — although multiple generation copies do not come up too well, so there is room for improvement in this area.

Since only 5% of the ultimate market has thus far been tapped, there may still be a future yet for a previously untried format. For instance there are two high speed longitudinal systems ready for marketing by BASF and Toshiba respectively. The Technicolor Corporation has produced a machine that uses a  $\frac{1}{2}$  inch tape cassette little bigger than an audio cassette, so if you are waiting to see which system becomes the world standard, don't hold your breath.

In the professional field two major helical formats are competing for position — SMPTE format B and C. For electronic news gathering the U-Matic format has been modified to produce close to broadcast quality pictures called BVU (Broadcast Video U-format).

In future articles we will study the theory of video recording and examine the technical details of how each format differs from the other.

ARA

or 16 TV lines of signal — about 1024 microsec. — a helical tape track may contain one full field of 312.5 TV lines — 20,000 microseconds. This feature makes still frame presentation from a helical machine easy to obtain. However, tape stretch and temperature variations with helical machines have always been a problem — with such long tracks — and have until recently kept such machines out of the realm of the professional. But with modern developments especially in the field of time base correction (more on this later), helical machines are ousting quad machines from their previously unchallenged role. Helicals use less tape, are cheaper, lighter, and less complex than their quad equivalents.

Since the early 1960s we have seen a stream of helical machines designed for the sub-professional and domestic market. They have used  $\frac{1}{2}$ ,  $\frac{3}{4}$  and 1 inch tape and differ in all factors mentioned previously — and even more.

## VARIOUS STANDARDS

Soon after the introduction of helical machines, half inch tape became most popular, but it was not until 1969 that a standard (the EIAJ) was even reached for head drum size and speed. Up until this time all helical recorders had been monochrome only, but now colour machines began to appear.

Cassette and cartridge machines were introduced in an endeavour to simplify the sometimes complex threading arrangements of the early recorders. One system introduced at this time and still popular today with semi-professional users is the U-MATIC of Sony using a  $\frac{3}{4}$  inch tape cassette. The first of these was for the NTSC (American/Japanese) market but PAL recorders appeared in 1973. Video bandwidth was about 4MHz which did not greatly degrade the normally 5 MHz bandwidth pictures, and signal to noise ratio was quite good.

In 1972 Philips released the first recorder specifically aimed at the domestic market. This was the NV1500 using a  $\frac{1}{2}$  inch, one hour tape cassette in a reel-over-reel format. The recorder — and there are still plenty around on the second hand market today — featured a built-in tuner, a 24 hour time switch, and a UHF sound and vision modulated output for replay through a home TV receiver. This machine also featured drop-out compensation — an accessory previously available only on more expensive machines — which inserts clean video information into any noise streak created by temporary loss of head-to-tape contact such as may be caused by dust particles, shed oxide, etc.

In 1975, in the USA Sony introduced the Betamax system offering a one hour recording time on a physically small,  $\frac{1}{2}$  inch low

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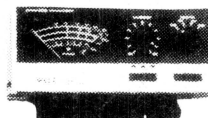
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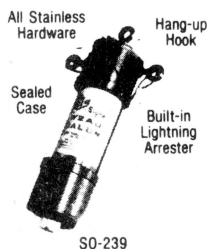
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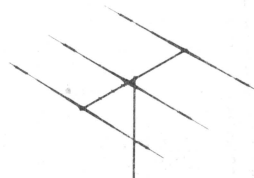
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# Equipment Review



## ICOM IC-730 A RETURN TO HUMAN ENGINEERING

NO matter how many amateur rigs pass through our hands, there is always a few that have a special operator appeal. There exists an elusive recipe for producing just that right combination of mechanical feel and electronic gymnastics which interfaces ideally with the user. Obviously, every manufacturer aims to realise this ultimate goal, but only an occasional rig actually attains this desirable level of perfection.

Icom's engineers have really 'fired' in designing the IC-730 and produced a little box of wizardry that will satisfy all but the most stringent operator demands.

Icom has always been recognised as a leader in Japanese amateur equipment innovation, however in recent times some observers have been concerned that the image was suffering from the *demon* technology rather than being enhanced. Without doubt the push-button concept can be stretched too far.

In the IC-730, Icom has rationalised the better aspects of both analog and digital techniques to arrive at a superb combination of electronic and mechanical innovation which fits neatly into the realm of human engineering.

At first glance the IC-730 is similar to most of the present generation Japanese

amateur transceivers; it is compact, attractive and apparently, very much state-of-the-art. It seems that everyone is into aesthetics these days and from the heavy cast heat exchanger on the rear panel to the carefully detailed and labelled fascia, one must conclude the manufacturer has done a startling job of packaging and presentation. Even when the 701 is fired-up initially it does all the classic things we have come to expect from the modern day Nippon manufacturers. However, after a few minutes at the controls, the user is forced to concede that there is something special about this latest offering.

Without quite realising why, an operator immediately feels *at home* with this new rig. The secret... sensible knob design and panel layout where operator priorities are valued higher than microprocessors or frills that don't really accomplish anything. Of course, all the good mechanical design in the world will not compensate for inadequate circuitry - but there is no need for concern, the IC-730 has *got it all together*.

A glance at the photograph tells the panel layout story. All functions are impeccably labelled and legibility is first class. The analog output/ALC/SWR/'S' meter is adequately large and well marked - even though 'S' calibration doesn't seem to align itself with any special standard.

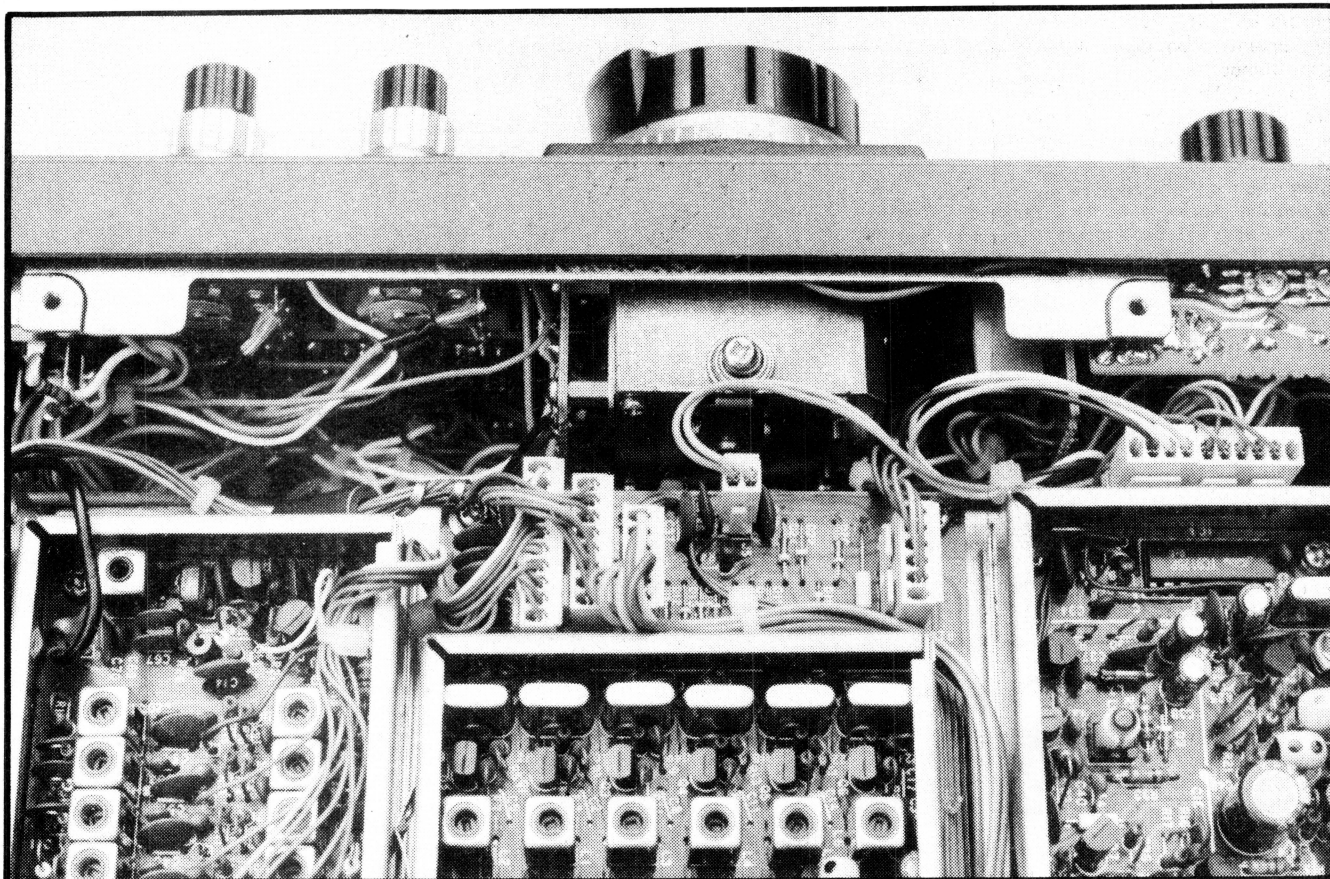
Apart from the usual sideband and CW facilities, AM is provided. The receiver gives an unusually good account of itself on AM signals as a 6kHz filter permits the greater bandwidth AM to pass relatively unobstructed - gone is the nasal SSB filtered AM signals. It is now quite possible to listen comfortably to commercial shortwave broadcast stations.

While the carton states that the 730 is an 'all band HF transceiver', in fact this is not quite true - by Australian standards at least. 160 metres has been omitted - which is a pity since the AM facility is so good - however, the three new WARC bands of 10, 18 and 24 MHz are included.

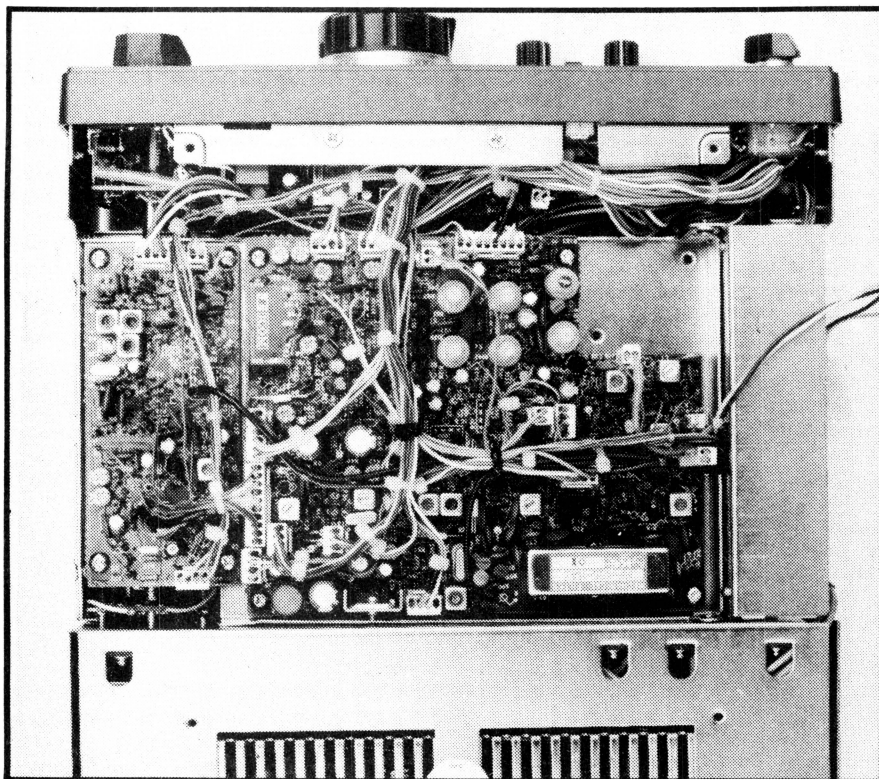
Only two LEDs are provided on this rig - one for transmit and the second to indicate that RIT has been activated. The RIT control offers plus or minus 800 Hz off-set and is activated by an adjacent press-button. The fail-safe IC-211 feature is not incorporated. For those not familiar with the IC-211, the RIT control is interconnected with the main tuning so that it remains in circuit only while the main dial is stationary. Instantly main tuning is adjusted, the RIT function is cancelled - this does not happen on the 730.

Digital frequency readout for main tuning employs gas discharge tubes; turquoise in colour and having a very intense light output,





**Top** — A solid die-cast module protects the main tuning 'strobe' or 'chopper' sensing circuitry. From the output pulse train, frequency steps and tuning direction are derived.



**Above** — Inside the screened compartments — lids removed — layout is typically Icom. Note the use of large ferrite beads in the wiring loom.

so there is no legibility problem under bright ambient light conditions. Resolution is down to 100Hz with *tens* digit blanking on the lower bands.

As with most recent Icom amateur transceivers, the 730 sports two VFOs described as A and B. Both operate independently of the other and the outputs can be exchanged at the touch of a button. Great for split operation or for keeping an ear on some preferred net while the second VFO is free to tune.

The VFOs are in fact processor controlled synthesisers employing real state-of-the-art technology; although in the 730 the emphasis is off processors and heavily on results. By using a pre-mix circuit arrangement, frequency steps - tuning rate - are selectable between 1kHz and 10Hz per increment or decrement - 100Hz is the intermediate rate. The main tuning control is smooth, but not the smoothest we have encountered, however, the variable tuning rate facility more than compensates for any shortcoming in this area.

In the 1kHz step mode, traversing the band to any desired frequency takes only an instant, while the 100Hz rate allows medium speed band ranging. Sideband stations are quite easy to net in the 100Hz mode, however, the 10Hz mode offers real *bandspread* advantages for fine resolution. The human ear is unable to discern 10Hz frequency variations and tuning sounds exactly like an analog VFO. This outstanding feature combined with an excellent IF bandpass shift control has a great deal to offer when tuning crowded bands - sort of takes out the hard work from DXing. The various tune rates are

selected by three adjacent press-buttons which are located very logically for a right handed operator - perhaps not quite so good for a left-hander.

A dial lock facility disengages the electronics from the dial knob - a handy feature when the kids are round, but more appropriate for 'on the passenger seat' mobile operation. While the IF shift works very well, we found the slider type control fractionally too loose to the band change switch and on occasions it was knocked from its *normal* centre position through careless operation of the band switch. We would prefer to see a centre position detent on this control, however, lack of it does not detract from operating efficiency.

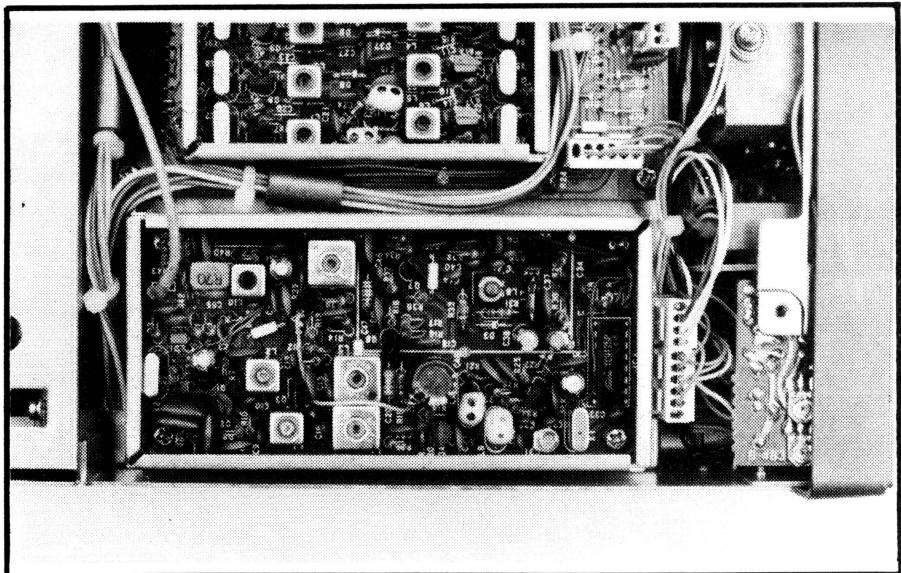
The 730 controls are carefully designed for use by human fingers - perhaps a few other manufacturers will take the hint on future models. The RF and AF gain controls are mounted concentrically - *mic. gain* and *RF out* also - the knobs have been the centre of some careful thought. The size and shape of the knobs is so arranged that either or both functions are easily operated independently without the operator needing double jointed fingers. Just a small point, but quite important when your shack is in the house - especially when mum and the kids are asleep.

The band change switch has a very positive feel and is similarly well designed. Icom owners familiar with the clunking solenoid band change will be pleasantly surprised to hear the 730 select a new band. All the operation delay and *hammering* is gone in this model.

Those who prefer the rig to remember frequencies will enjoy the in-built memory facility. One frequency per band can be saved for later retrieval, but unfortunately, there is no internal memory battery back-up for when the 730 is used with the IC-PS15 power supply. When you turn-off the rig, both AC and DC are simultaneously disconnected. In a way, this is one of the lesser points on which to recommend the transceiver. It suffers from the same problem that was detailed in ICOM TIPS last issue. Dangerous mains AC is looped through the low voltage circuitry to the front panel power control. This could be a real trap for an unsuspecting amateur who decided to adjust or repair the transceiver. Even with the power switch 'off', mains AC is still connected to the rig until the power supply is disconnected - so watch your fingers, or modify the circuit as outlined last month.

At long last Icom has *got it all together* in the noise blanker department, and in this model, we have to give them full marks for the effort. Not only does the blanker almost completely knock out impulse noise, but it makes a pretty good dent in many types of power line hash, and, wait for it, belts the wood-pecker right up the beak. Don't expect any miracles on the Russian OHR, but the blanker does substantially reduce this interference - with one small sacrifice; it distorts the wanted signal to some degree. This is a small price to pay for the advantage offered.

The noise blanker is activated by a single press-button which either inserts or removes the function from circuit. The blanker time



constant is adjustable in two stages - long or short - and access to this switch is gained through a removable panel on the top-side of the case. Probably a bit fiddley for some operators, but presumably Icom decided to locate it inside in preference to congesting the fascia. One unfortunate effect of using the noise blanker on a crowded band where many strong signals exist is the possibility of bulk unwanted mixing products which appear as adjacent frequency interference. With the blanker 'out', high level response is generally quite good.

Also found under the removable panel are the controls for VOX delay, anti-trip and gain. VOX operation is achieved through a front panel press-button. Adjacent to VOX is a transmit override or MOX press-button. AGC action is good and quite resistant to high level transients. Two time constants which cater for most requirements are available through another press-button. A further press-button switches a receive pre-amp in or out of circuit. In practice, the effect is similar to having available an attenuator and we didn't find that there was any special improvement in overload capability; however, the 730's overload resistance is quite good.

Receiver sensitivity is good and the rig compares well with *top-shelf* competition from Icom and other Japanese amateur equipment manufacturers.

On transmit, the 730 really is a sweet little rig. Audio reports were always good and the power reliably 'talks-up' to its quoted 100 watts PEP - 200 watts PEP input allowing for 50 per cent efficiency in the finals. The VOX works well and has plenty in hand for all occasions. An internal switch marked 100W-50W allows the operator to select peak operating level with only a little inconvenience.

The in-built speech processor also produced good reports, but in most instances its use was not required. Controls for the processor are also located under the removable panel atop the instrument case. A bit awkward to access but not a major complaint.

We had only one complaint with the transmitter and that was a mechanical feature of the rig. The forced air cooling of the finals is not thermostatically controlled and operates quite noisily from the outset of transmission. The noise is not what might be termed obtrusive, however, many operators might find it annoying that such an advanced transceiver should suffer from this deficiency - especially in 1981. Let's face it, a few other rigs also suffer the same complaint. In a quiet shack, the *whirring* is a bit distracting.

Inside the little *black box* previous Icom history remains unchanged - good, strong metalwork and high quality components. While all PCB components are clearly labelled the components are so tightly packed that access to individual resistors etc. is often quite difficult. All PCBs are securely mounted and acceptable wiring looms interconnect various boards together through locking connectors. Some areas could well amount to servicing nightmares, but we weren't about to dis-assemble the rig any further than that shown in the photographs to find out what gives. As a general rule with equipment of this sophisticated nature - leave servicing to the people who are equipped and qualified to handle it.

#### SUMMARY

If you are into Japanese rigs, the Icom IC-730 is pretty hard to beat in the \$1000 stakes. It has all the good looks and performance that most amateurs will ever need in an HF transceiver. It possesses that difficult to acquire, delicate balance between modern technology and human interfacing - a balance where engineering ends and comfortable operating begins.

The 730 is difficult to define any further in literary terms without using superlatives, so we suggest that prospective owners should drop into an Icom dealer and try it out for themselves. This is one of those occasions where *hands-on* experience surpasses the written word, because the rig doesn't look all that different from the others - it just feels and sounds comfortable to the user.

Our thanks to VICOM of 68 Eastern Road, South Melbourne, for supplying the IC-730 for review.

**A R A**



# T-1200



## 2m/FM SYNTHESIZED PERSONAL TRANSCEIVER

In the race of popular demand for quality in fully synthesized, multifeature hand held transceivers, the T-1200 emerges as the commanding front runner. More than just handy, the T-1200 stands on a solid platform of big rig features which fully utilize the very latest microprocessor technologies.

When you choose T-1200 you opt for 4 modes of automatic scan and search of 10 memories and the whole band. When you choose T-1200, you opt for selectable output power of 3.5W or 1.0W, with only a 6ma drain for the optional continuous display of the bright LED readout. When you choose T-1200 you opt for variable scan steps in any multiples of 5kHz. And when you choose T-1200, you opt for a band range that covers more frequencies than any other hand held, and the ease of entering all frequencies from the integrated keyboard. Assuredly, when you choose T-1200 you opt for the majority leader which hands over features hand over fist.

### SPECIFICATIONS • MODEL T-1200

#### 1. GENERAL

- Frequency Range: 144-147.995 MHz, (USA)  
143-148.995 (149.995)MHz (USA SPECIAL)
- Number of Channels: 800CH (USA) 1200CH (USA SPECIAL)  
(5kHz step): 800CH (USA) 1400CH (USA SPECIAL)
- Type of Emission: F3
- Memory Channels: 10 Channels
- Antenna Impedance: 50 ohms
- Power Source & Voltage: 9.6 VDC by Nickel Cadmium Battery Pack
- Dimensions: 70mm (H) x 47mm (D)
- Weight: 600gr.

#### 2. TRANSMITTER

- RF Output Power: High-Power Level: 4 Watts;  
Low-Power Level: 1 Watt
- Modulation: Variable Reactance Frequency Modulation
- Maximum Frequency Deviation:  $\pm 5$  kHz
- Spurious Radiation: Less than  $-60$  dB
- Microphone in Use: Condenser Microphone
- TX & RX Frequency Shift:  $\pm 600$  kHz (From the receiving frequency or on Memory Channel 1)

- Telephone Tone Frequencies: optional for USA only
- Tone Burst Frequency: Standard 1,750Hz

#### 3. RECEIVER

- Receiver Circuitry: Double Superheterodyne
- Intermediate Frequency: 1st IF: 16.9MHz;  
2nd IF: 455kHz
- Sensitivity: Less than 0.32uV
- Squelch Sensitivity: Less than 0.32uV
- Pass Band Width:  $\pm 7.5$  kHz (6dB);  $\pm 15$  kHz (70dB)
- Audio Output: More than 300mW

#### 4. STANDARD ACCESSORIES

- Helical antenna
- 9.6 VDC nickel cadmium battery pack
- Strap band
- Battery charger
- Earphone

#### 5. OPTIONAL ACCESSORIES

- Ext. speaker-MIC
- Soft case
- Car converter
- Whip antenna  $\frac{1}{4}$  or  $\frac{5}{8}$   $\lambda$

### CHECK HOW THEY STAND ON THE ISSUES:

T-1200	YAESU FT-207R	KENWOOD TR-2400
Texas Instruments TMS-1000 micro-processor	NEC-650	NEC-650
Rx on 143 to 149.995 MHz Tx on 143 to 148.995 MHz (1200 channels with MARS coverage)	Rx & Tx on 144 to 147.995 MHz, Ham band only (800 channels)	Rx & Tx on 143.9 to 148.495 (900 channels with some MARS coverage)
Direct keyboard entry of all frequencies. Keyboard entry of 5kHz digit which stays in memory	Keyboard entry of 10kHz steps with a switch for 5kHz steps.	Direct keyboard entry of Ham band only. MARS frequencies must be entered into a memory by stepping and recalling.
10 programable memories with frequencies preloaded on cold boot.	5 programable memories. All memories loaded with 144.00 on cold boot.	10 programable memories. All memories loaded with 145.00 on cold boot.
Up/Down variable scan steps in any multiples of 5kHz over whole band or auto-scan of 10 memories. Scan (restart) or search (lock) modes for both band and memory modes.	Up/Down scan with 10kHz steps only. Misses every other 15kHz by 5kHz. Locks without restart.	Scans 10 memories only. Restart only: lock mode not available. Continuous band scan-search not available.
Full 16 button TTP with LED display of number as it is dialed.	12 button TTP only.	Full 16 button TTP. Readout of the number dialed is not available.
9.6v 500mah battery (included)	10.8v 450mah battery (included)	9.6v 500mah battery (included)
Tx High: 3.5W (4W nominal) Tx Low: 1W	Tx High: 2.5W Tx Low 200mW	Tx at 1.5W only.
Readout: LED	Readout: LED	Readout: LCD
Volume: 543cc 170mm(H) x 68mm (W) x 47mm(D)	Volume: 664cc 181mm(H) x 68mm(W) x 54mm(D)	Volume: 640cc 192mm(H) x 71mm(W) x 47mm(D)



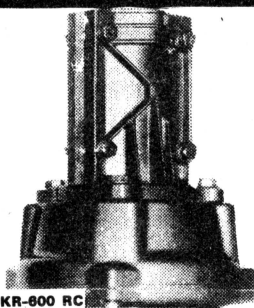
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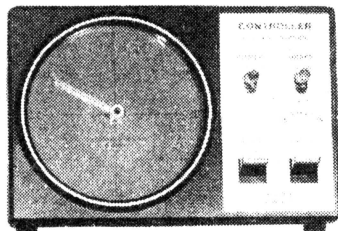
**KR-800 RC**

Identical to Daiwa DR 7800 R

**Specifications:**

Input Voltage: 117/230 VAC, 50/60 Hz  
Power Consumption: 40 VA  
Rotation Time: Approx. 53 sec/60Hz; 63 sec/50Hz  
End-of-Rotation Stopper: Electrical and Mechanical  
Rotation Torque: 600 kg-cm (520 lbs-in)  
Stationary Brake Torque: 4000 kg-cm (3,470 lbs-in)  
Vertical Load: 200 kg (440 lbs)  
Permissible Mast Size: 38-63 (1 1/2-2 1/2 in)  
Cable: 6 conductor cable No Sign 22 or larger

## ANTENNA ROTATORS



**KR-400**

**Specifications:**

Input Voltage: 117/230 v AC, 50/60Hz  
Power Consumption: 40 VA  
Rotation Time: Approx. 50 sec/60Hz  
End-of-Rotation Stopper: Mechanical  
Rotation Torque: 400 kg-cm (340 in-lbs)  
Stationary Brake Torque: 1500 kg-cm (1300 in-lbs)  
Vertical Load: 200 kg (440 lbs)  
Permissible Mast Size: 38 - 63 (1 1/2-2 1/2 in)  
Cable: 5 conductor cable No. Sign 22.

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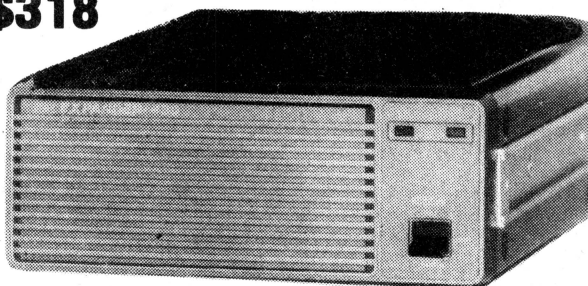
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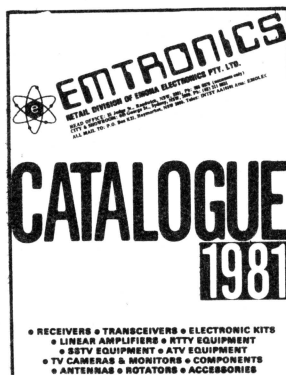
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AUTOMATIC ANTENNA SWITCHING**

If you are missing out on those weak DX signals because your receiver needs more sensitivity, here's a low-cost way to hype it up: Add the new Mizuho SX-3 pre-selector/preamp

The SX-59 adds 20 dB of gain (3 or 4 S-units) with low noise. Tunable in 3 switched bands from 3 to 30 MHz, the unit is completely automatic in antenna switching — turn it on and it connects itself to the antenna, turn it off and the antenna is reconnected to the receiver. No manual bypass is needed.

**\$98**

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CATALOGUE**

# ARA PROJECT

## 400 ON SIX

By Robert C. Begg VK3BOB

One of the first questions asked by the home constructor about any project is, will it be worthwhile? Well, after three seasons on six metres, two main factors have become obvious to me.

To work DX, particularly rare DX, first you need to be listening at the right time, and secondly, you need sufficient ERP to get back to the station you can hear.

One can only dream about the many countries that could have been worked in the past few years, had the station been running the maximum allowed power and VKs been permitted the use 50 to 52 MHz.

However, getting back to reality, many Australian stations have optimised their antenna systems and tower heights — within reason — and are severely limited with regard to further expansion in this direction. So, the next logical step is — you guessed it — more power.

I have heard many people say you don't need high power to work skip on six metres, but it only takes one good opening on that band to find operators using high power are

still working DX after the others have given up. This type of demonstration convinces one that high power really pays off in the long run.

Having made the decision to build a linear, various tubes were considered — 3/500Z, 4CX250B and 8875 were among the main contenders. However, when looking at the questions of cost, cooling, filament supply, physical size and power output, the 8875 emerged a clear winner.

The 8875 is designed for linear operation when cathode driven in class B.

Having built several of this type of linear amplifier in the past and found that careful layout provides a good degree of stability, I had no trouble in getting the unit described here up and flying.

This style of circuit offers high anode efficiency combined with low intermodulation distortion and is capable of high output with a minimum input drive level.

The amplifier is operated in Class B — see Fig. 4 — This means the operating duty cycle is about 50 per cent or 180° and the valve delivers power for one half cycle while being cut-off for the next half cycle. This does not cause any distortion because the other missing half cycle is supplied by the *fly wheel* effect of the output tank circuit.

It should also be kept in mind that an amplifier of this type outputs what is known as *feed-through power*. If the amplifier is operating at 400 watts PEP output, then 380 watts are supplied by the 8875 while the additional 20 watts is made up from the input drive signal as power fed through the valve.

The full amplifier schematic is shown in Fig. 1. The power supply is detailed in Fig. 3 and control circuits appear in Fig. 2. A loaded plate voltage of 2000 volts is used while the series plate current is about 350 mA.

The anode output circuitry consists of a fairly standard tapped PI network. A compromise must be derived for plate circuit Q

### PARTS LIST

#### SEMICONDUCTORS

D1 to D12 diode 3A 1kV  
D13 to D17 diode 1A 400V  
D18 1N914  
Z1 8.2V 10W zener

#### MISCELLANEOUS

RL1 heavy duty wide spaced relay — 10A contacts  
RL2 wide spaced relay — 1A contacts.  
S1 2 pole 4 position switch heavy duty — non-shorting.  
S2 2 pole 5 position light duty switch — non-shorting.  
S3 — S4 AC 2A toggle switch.  
Meter — 1mA  
Fan — small computer type approx 2.5 inch dia.  
T1 230V prim. 1700V sec. centre tapped. — 500VA.  
T2 230V to 6.3V 3A — 34V 100mA or similar.  
Vacuum tube type 8875 and socket

#### INDUCTORS

(see text)

RFC-1 3 inch x 1/2 inch ferrite rod trifilar wound with 11 turns of 12 gauge enamelled copper wire.  
RFC-2 3.5 inch x 5/8 inch dia. polystyrene rod — 30 turns of 22g enamelled copper wire spaced over 3 inches.  
RFC-3 10 ohm 5W carbon resistor with 1 turn of heavy copper braid.  
L1 3/16 inch dia. copper tube — 2.75 turns — 2 inch I.D. spaced 1.5 inches. Tap at 1 turn from anode end — silver plated.  
L2 8 turns 0.5 inch I.D. spaced 5/8 inch — 18g tinned copper.  
L3 8 turns 0.5 inch I.D. spaced 0.75 inch — 18g tinned copper.

#### RESISTORS

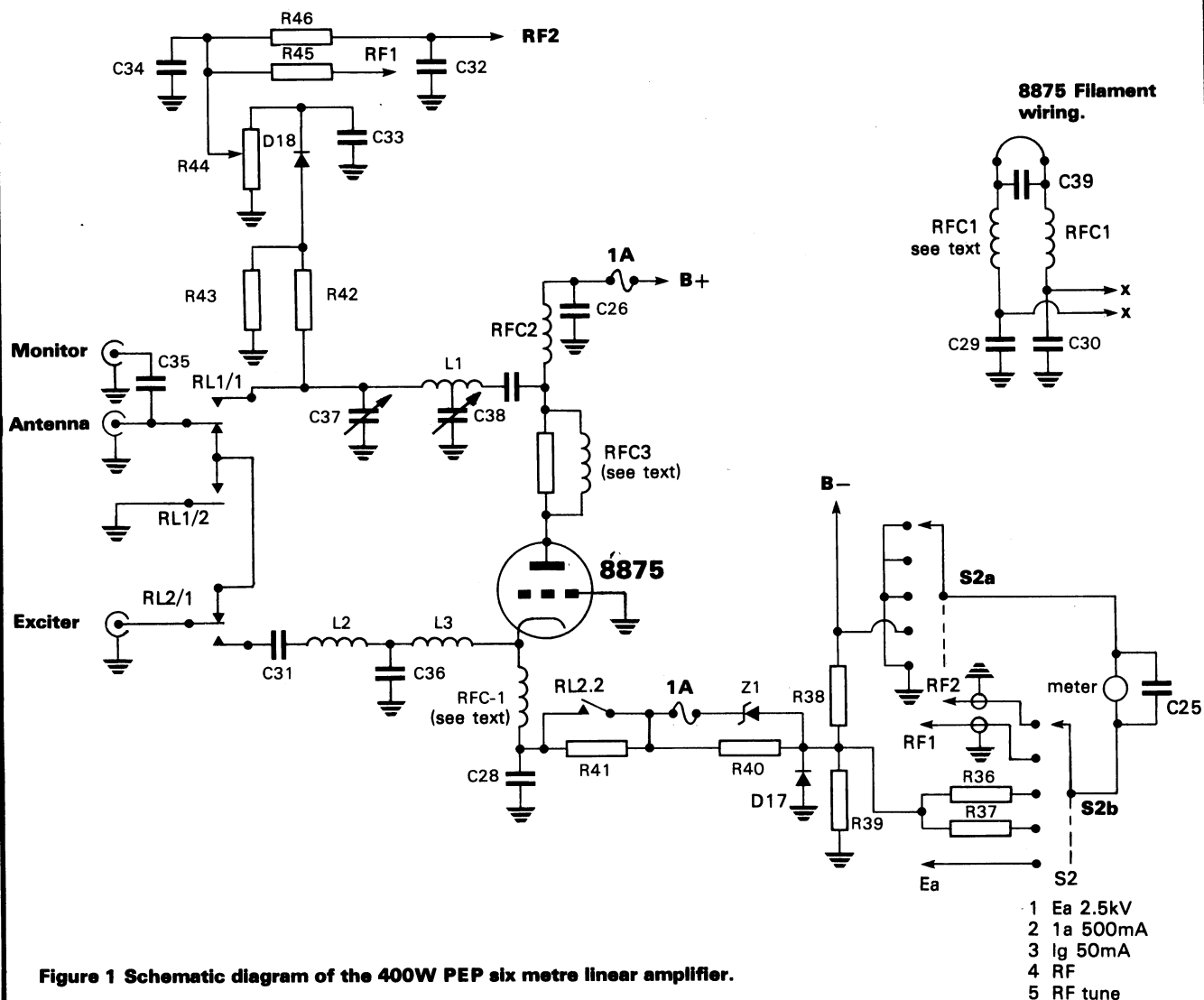
R1 to R12 470k 1W  
R13 330R 5W  
R14 4k7 5W  
R15 set for relay I  
R16 to R31 220k 1W  
R32 5 x 390k 1W in series  
R34 33R 1W  
R35 180R 10W  
R36 1k5

R37 56R  
R38 3R3 5W  
R39 50R 5W  
R40 220R 10W  
R41 10k 10W  
R42 39k 1W  
R43 1k 1W  
R44 1k trim pot  
R45 1k5 1/2W  
R46 330R 1/2W

#### CAPACITORS

C1 to C12 — C21 0.01uF 2.5kV  
C13 to C20 400uF 315V (150uF x 150uF x 100uF in can parallel)  
C22 — C23 — C25 0.001uF 1kV  
C24 470uF 50V  
C26 0.001uF 5kV  
C27 500pF 20kV "door-knob"  
C28 — C29 — C30 — C39 0.01uF 1kV  
C31 0.01 2.5kV  
C32 200uF 16V  
C33 0.01uF 50V  
C34 0.002uF 50V  
C35 10pF trimmer  
C36 50pF variable  
C37 450pF broadcast gang  
C38 50pF double spaced HV variable.





when considering efficiency and harmonic suppression. A circuit Q of 12 is a good choice.

The Q of a circuit is determined by its L/C ratio and the load impedance at which the tube is operated. This latter value is approximately related to the ratio of DC plate voltage to DC plate current. For Class B operation the formula is:

$$R_1 = \frac{\text{Plate Voltage}}{[1.57 \times \text{Plate Current}]}$$

$$\text{so, } R_1 = \frac{2,000}{[1.57 \times 0.350]}$$

$$R_1 = 3,640 \text{ ohms}$$

This value is only an approximation, but it serves as a starting point in calculating circuit values.

Tables 1 through 3 are used to determine tank circuit inductance and capacitance and are optimised for a Q of 12.

In practise these values worked out very close to the mark. Due to stray capacitance and the need to allow for small variations in load impedance and tuning frequency, values a little larger than those quoted were used.

## DESIGN CONSIDERATIONS

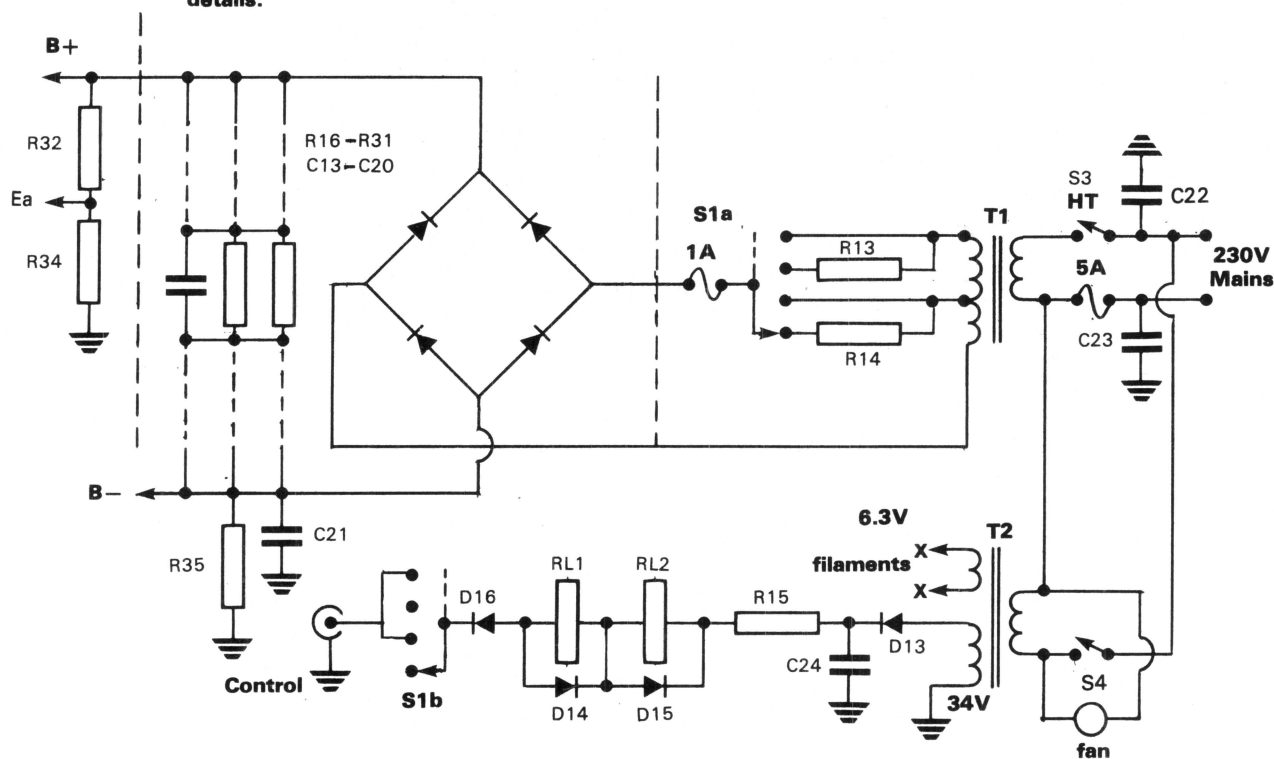
The power transformer I used has a 230 volt AC primary with 1800 volt centre-

tapped secondary. Secondary current rating is 500 mA with a 50 per cent duty cycle — 500VA. Because of the low average power content of human speech, a 100 per cent duty cycle is unnecessary.

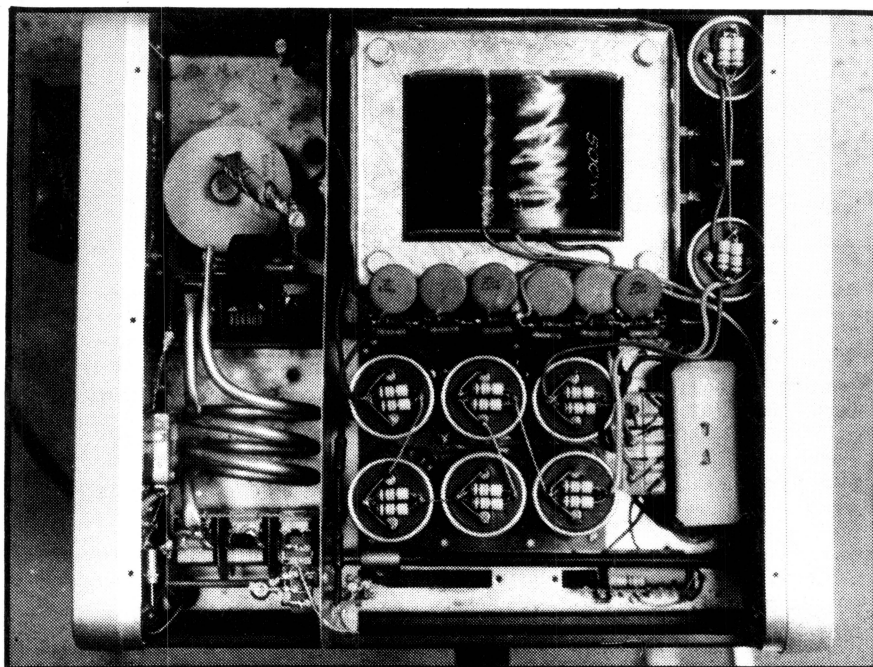
To guard against excessive *inrush* current in the stand-by mode, series resistors are used to inhibit current flow. A popular alternate method is to employ a series resistor which is shorted out after a predetermined time delay from turn on — this is usually achieved electronically.

The bridge rectifier diodes are in series to achieve sufficient peak inverse volt-

**NOTE — See opposite page for bridge details.**



**Figure 2**



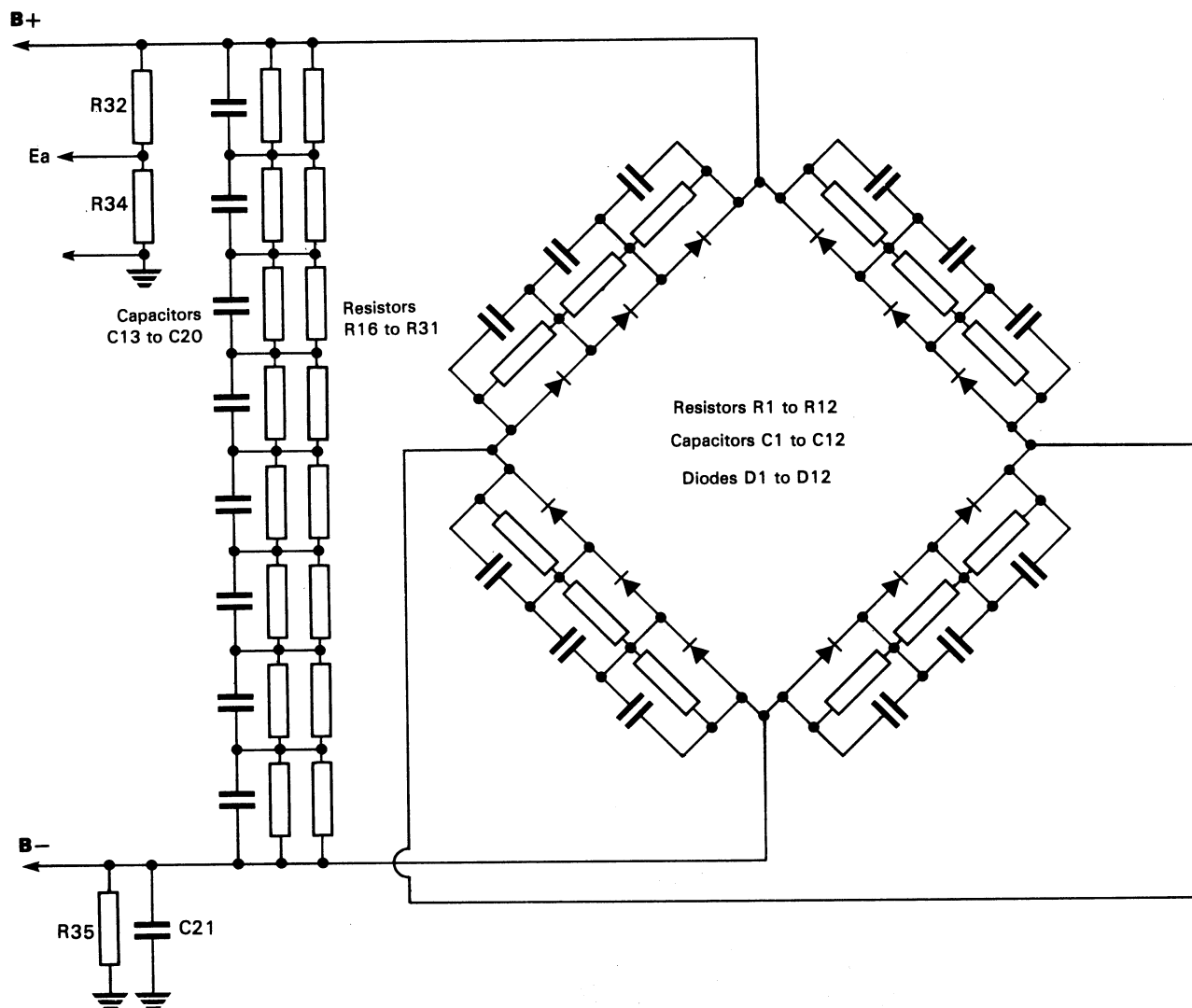
age rating. To equalise the voltage drop across the diodes — equal PIV sharing — dressing resistors are added along with capacitors which help absorb higher than normal voltage transients which may occur from time to time.

The reason I used eight 400 uF capacitors in the filter circuit is simple — economy and component availability. I think they are still readily available. Resistors chained across the filter capacitors provide voltage balancing and also a bleed path to discharge the capacitors when the amplifier is turned off.

I would suggest that before you use surplus capacitors in such high voltage applications, check that the capacitors are properly formed.

If they have been laying on the shelf for some years there is a chance they are not operational. This is easy to rectify. Simply connect a resistor in series with the capacitor — 100k 1W — and apply about 200 volts. When the voltage across the plates starts to rise, increase the supply voltage and decrease the series resistance until the correct voltage drop is established. The process may take from a few minutes to a few hours depending on age and condition.

**Figure 3.**



**Enlarged schematic of the bridge rectifier power supply.**

The capacitors I used were fairly large metal cased types and since there are eight in series the problem arose of how to insulate them from earth and each other. I decided to use Araldite — epoxy resin polymer — to fix them to a large slice of 4mm thick fibreglass circuit board with about 6mm spacing between each can.

## FILAMENT AND RELAY SUPPLY

For economy, a small transformer was purchased from a disposals source. It has a 34 volt winding and a 12 volt/3 amp winding. Turns were removed from the 12 volt winding until, with the filament chokes in

circuit, 6.3 volts was measured across the 8875 heater terminals. The relays in my amplifier are in series because of the high voltage DC supply which resulted from using the 34 volt winding. In your case, any arrangement that will reliably operate the relays will serve well.

## THE FILAMENT/CATHODE CHOKES

A standard half inch diameter broadcast band ferrite aerial rod was used. This was broken into pieces about three inches long and one section was wrapped with PVC electrical tape and trifilar wound with 12 gauge insulated copper wire. About 10 turns

amounts to a coil length of 2.4 inches. Trifilar means three wires wound side-by-side. Heat shrinkable PVC was used to encapsulate the choke.

## RF SWITCHING RELAYS

Disposal, heavy duty, wide spaced type relays were used. The input relay contacts can be about 1 amp rating while the power out relay should have heavy duty contacts capable of handling up to 10 amps.

No specific type is suggested here — only that the contacts and insulation can tolerate the encountered power levels. Do not use the types where the armature return spring is part of the spring-set connections, as these introduce an unwanted inductance.



## CATHODE RETURN PATH

A 10k ohm resistor is in circuit during stand-by. It develops quite a high bias voltage which is used to cut-off the 8875. If this is not done the tube could develop enough shot noise level to mask out weak signals on receive.

The 8.2 volt zener diode sets the correct bias point for the 8875 during transmit.

The one amp series fuse offers protection against the zener developing a short circuit condition and thus prevents the full 2500 volts high tension being applied to the 8875's cathode. The zener is mounted on a metal plate measuring 4.5 inches x 5 inches which is supported by 1 inch insulated stand-offs. This arrangement provides adequate heat dissipation.

## METERING

It was decided to meter the B+ voltage as a good indication that all is well with the high voltage supply and as an indicator of safety when it became necessary to delve into the circuitry.

Anode current (Ia) indicates the output tuning and loading conditions. Grid current (Ig) is also monitored. This feature is very important in this type of amplifier because the valve can be easily destroyed by high grid current. Excessive grid current can be produced by too much drive or incorrect loading of the plate circuit.

When transmitting I usually keep an eye on grid current and another on my monitor-scope as the excitement of DX working often causes me to talk louder than usual — this can lead to overdriving or output clipping.

Two output/RF positions were included in the metering circuit although only one appears on the panel layout. I didn't forget, the panel looks better balanced that way.

## INPUT MATCHING

The purpose of L2, L3 and C36 is to match the 50 ohm exciter output to the linear cathode input circuit. The cathode input impedance is related to the ratio of peak cathode signal voltage and the peak cathode current — the sum of grid and anode currents.

Input impedance of the 8875 is in fact quite close to 50 ohms — but only over the operating cycle. One might conclude that no input matching is necessary. Some amplifier designs leave out the matching and simply use a 50 ohm resistor. This is poor engineering practice as the method leads to increased intermodulation distortion, less plate efficiency and lower output as well — not to mention driver loading problems.

The input circuit Q should be five or higher. The input circuit shown here achieves a match of 1.2:1 SWR or better.

It is interesting to note that as the matching improves the grid current decreases for the same value output power.

## OUTPUT MATCHING

The method of deriving the PI output circuit has already been discussed. For greater harmonic reduction a PI-L output network could be substituted but this would change the L and C values already calculated.

Note that the tuning capacitor has been **tapped down** the output coil — L1. This was done to reduce the voltage appearing across the plates of the capacitor and thus reduce the possibility of burning out the mounting insulation on the fixed plates due to arcing over.

I first tried the circuit without the tapping and found that the capacitor was quickly destroyed. Also, tapping down the coil gives a bandspread effect thus enabling easier tuning.

After the amplifier was constructed and component values were properly verified, the output tank coil was removed and silver plated at a cost of about \$6. While many might consider this an unnecessary extravagance, the plating has a lot more to offer than looks alone. Tank circuit efficiency is improved by the silver coating, but its effect is most likely to be noticed after a couple of years service.

If you are new to VHF, you may not be familiar with the term *skin effect* stated briefly, skin effect is the phenomenon in which as the frequency increases, current flowing in a conducting circuit move closer and closer to the conductor's outer surface, or skin. This is why it is only necessary to use tubing instead of solid core conductors in many RF applications.

At HF, the electron flow in a conductor is limited to a few thousandths of an inch beneath the surface. The resistance and RF losses in a conductor increase with the square root of frequency and become increasingly important above 100 MHz. If the tank coil in this amplifier is not silver plated, the efficiency will decrease with age as tarnishing of the copper surface progresses.

With silver plating however, efficiency will be high for years longer.

You may notice the traditional RFC from PI net to ground is missing in this design. The reason? . . . I couldn't find one suitable. If you can locate one it will make a worthwhile addition. You will need a 1 millihenry choke capable of handling about 3 amps. It would usually be included as a safety measure in the event that the anode blocking capacitor becomes short circuit. The choke immediately shorts the HV DC to ground, blowing the fuse, and preventing lethal high voltage appearing at the antenna terminals.

## GENERAL CONSTRUCTION

There are two basic methods which could be considered:

- 1) Build the amplifier and power supply in separate cases.
- 2) Build both portions on the same chassis.

The latter was the method I chose, however, keep in mind the power transformer is

very heavy and the chassis must be adequately strong.

The secret of good construction is to carefully lay out all parts and securely mount all components. Remember that large currents flow in the filament supply and heavy conductors must be used. Similarly, high voltages and currents flow in the anode circuit, HT supply and the 8875 cathode circuit, so suitable heavy, well insulated conductors are needed.

The fan was positioned 10 millimetres from the 8875 where it would pump the best air flow across the anode fins.

The tune and load tuning capacitors are connected together — frame to frame — by heavy copper braid and in turn connected with the same braid to the antenna connector.

The tap on L1 was made using 3/16 inch copper tube — also silver plated.

## TESTING AND OPERATION

Testing and final adjustments should be carried out slowly and carefully. Always remember you are dealing with 2,500 volts. This supply cannot be likened to a shock from the ignition system of a car. THIS IS A HIGH POWER SUPPLY WHICH IS EASILY FATAL TO HUMANS. Never be tempted to make adjustments while the supply is turned on.

Also, make sure the electrolytics are properly discharged before touching any internal component — they are just as dangerous if charged.

It is possible to test that the tank circuit resonates by using a dip oscillator — the input circuit can similarly be checked. With the HT switched to stand by, switch on the AC toggle and note the meter reading — it should be about 1100 volts. Check switch positions 2, 3 and 4 — the reading should be about 2300 volts.

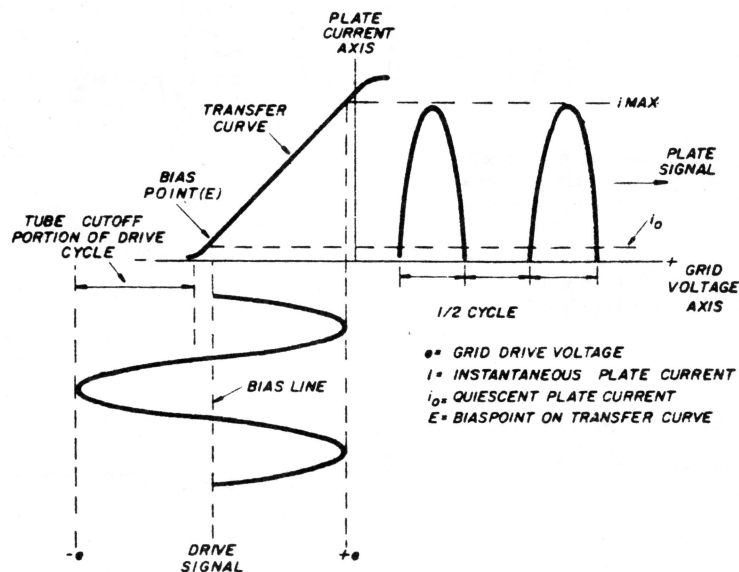
Switch off and wait until the volt reading drops to zero. The 1mA meter should be pre-calibrated to read 2500 volts for full scale deflection — Ig 50 mA and Ia 500 mA. Plug in the 8875 and switch on the filament supply. The fan should be operating and 6.3 volts should appear across the heater connections. With switch 1 set to LV stand by, switch on the HT and then set S1 to LV transmit.

At this stage connect a suitable dummy load to the output and your exciter to the input.

Operate the transmit control and the 8875 should go from cut-off to about 10 mA anode current. Apply a small level of excitation and tune for maximum output. All controls should peak — if not, some adjustment of the inductor is required. Continue increasing drive until about 100 watts output is reached. Be careful that grid current does not exceed 30 mA

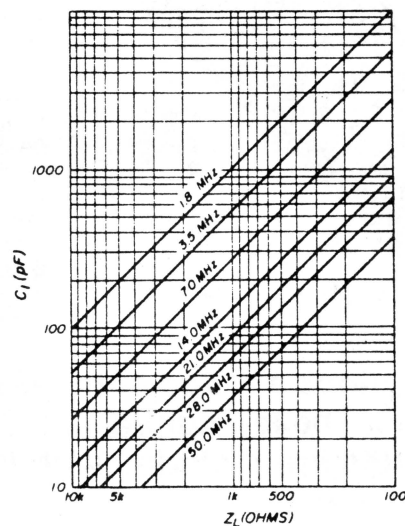
If all is OK, go to HV stand-by position and then HV transmit. Continue the tuning procedure with increasing levels of excitation, but do not overdrive the 8875.

Figure 4.



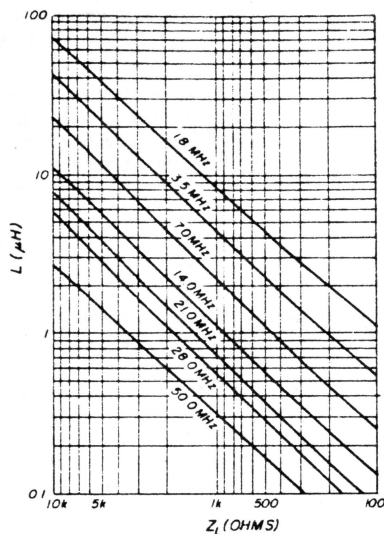
Anode current vs. bias and input signal to grid.

Table 1



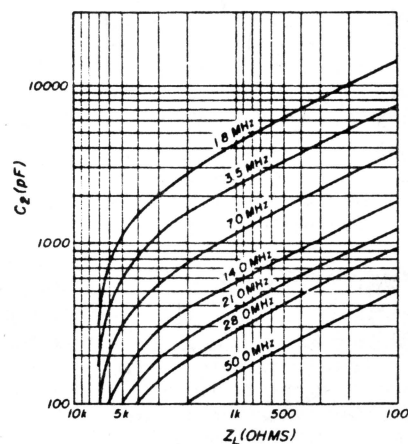
Tuning C vs. anode load

Table 2



Anode inductance vs anode load

Table 3



Load C vs. anode load

Using an SWR meter in the input circuitry, adjust the input tuning for minimum SWR reflected power — usually about 1.2:1. If this figure cannot be obtained, adjust (squeeze or expand) the input coil suitably. The anode and grid currents are sensitive to loading capacitance — if  $I_g$  is excessive then load capacity is incorrectly set.

If you expect a long, efficient life from your new amplifier keep these points in mind.

- 1). Always allow at least one minute warm-up time for the filament before applying HT.
- 2). Never apply excitation without first assuring HT is on.
- 23). Never over drive the tube — grid current should NEVER exceed 50 mA.
- 4). If you run  $I_a$  up to 500 mA during testing, keep it brief and allow adequate time for the valve to cool before re-applying power.

One final point. Pulsed tone with a low

duty cycle is ideal for tune-up. Keep an eye out for circuits — there are a few about (see the timebase circuitry use in the author's digital readout article, ARA Vol. 3, No. 13).

## CONCLUSION

Now that the winter doldrums are upon us it is an ideal time to set about construction in preparation for next year's six metre DX openings.

ARA

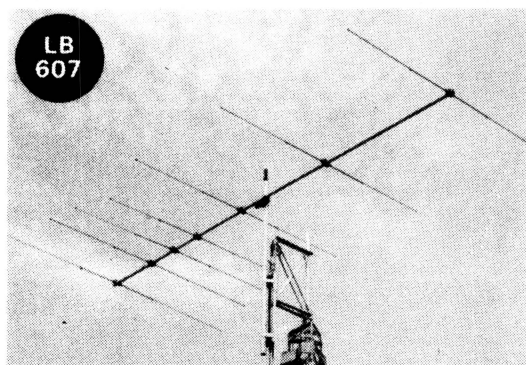
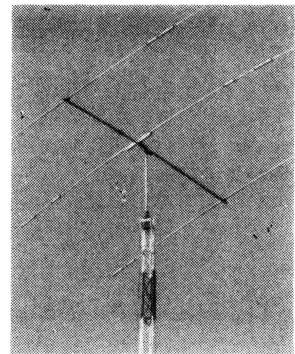
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VS20CL	14	3el	8db	2kw
VS2GH	144	G.P.	3.4db	500w
VS6GH	50	G.P.	3.4db	500w
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# UP DATE YOUR ICOM 701 INTERFACE

By Anthony R. C. Green, A.S.M. VS6EZ

In A.R.A. Volume 2, Issue 2 I described modifications to the Icom 701 and an interface to be used with a linear. Since that time my novel interface has outgrown its original cabinet, getting bigger and better in the process. As I now have a prototype Microwave Modules 2 to 6 metre transverter attached to my Icom 211, I wanted to know, when I was operating on HF when there was a Six Metre opening.

As I always use headphones and a boom microphone it would be difficult to hear the Icom 211 loudspeaker, so I arranged to

interlink the audio lines of the 701 and the 211 and feed both to the headphones. This way I am quickly made aware of 6 metre activity when my RM 3 unit, now attached to the IC 211, scans through a station.

On the interface I have added more switches and controls. A volume control knob for the new I.C. amplifier, a switch for the antenna switching, and another to select the transmitter — either IC-701 or IC-211. These are in addition to the switches which were described in the original article.

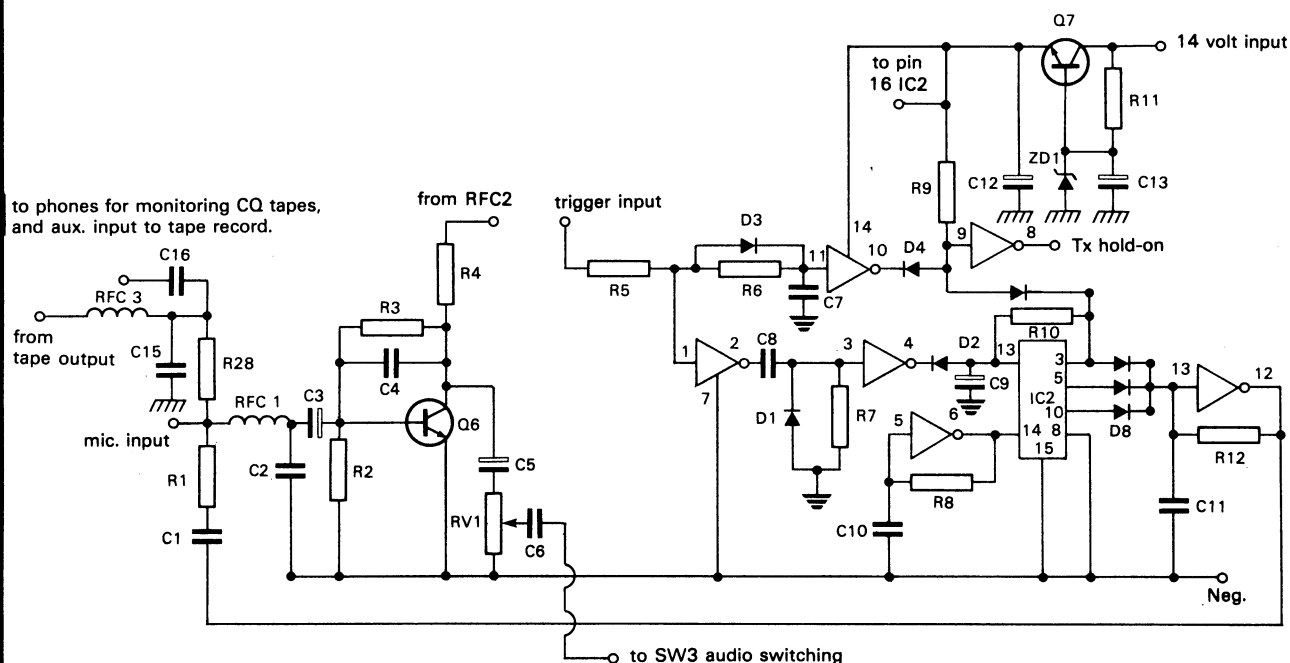
Additionally, three LEDs — red, yellow and green — have appeared on the front of

the cabinet to indicate which antenna is selected.

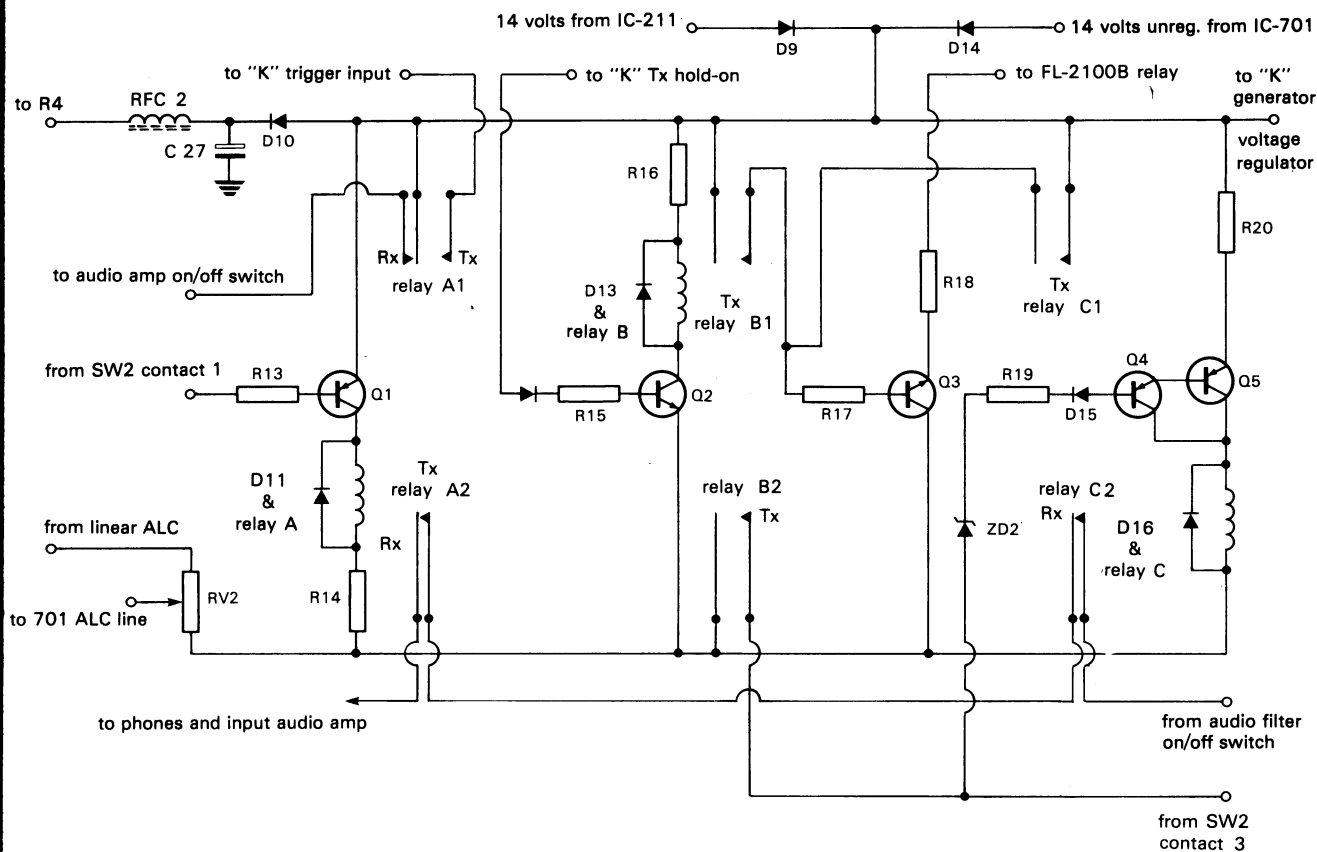
The 'pip-tone' circuit has now been removed and in its place is a 'K' generator which is more acceptable to the licensing authorities. Also added are sockets for tape record 'in' and 'out' which I use for my taped CQ calls, sockets for ALC output and for antenna switching.

As the 'K' generator is a bit susceptible to varying voltage rails, it was found very necessary to fit the Q7 circuitry, especially C12. Otherwise the Morse code 'K' tends to sound a bit chirpy. C10 sets the speed of the

Fig. 1. Microphone amplifier and "K" generator



**Fig. 2. Relay switching schematic.**



## PARTS LIST

### CAPACITORS

C1	0.01uF
C2	2000pF
C3	0.5uF
C4	1000pF
C5	0.5uF
C6	0.1uF
C7	0.04uF
C8	0.1uF
C9	2.2uF 10VW
C10	0.04uF
C11	5000pF
C12	200uF 10VW
C13	47uF 10VW
C14	0.1uF
C15	1000pF
C16	5000pF
C17	0.04uF
C18	5000pF
C19	30uF 10VW
C20	1000pF
C21	100uF 25VW
C22	0.04uF
C23	47uF 10VW
C24	200uF 25VW
C25	0.1uF
C26	200uF 25VW
C27	200uF 25VW

### RESISTORS

R1	390k
R2	10k

R3	47k
R4	6k8
R5	22k
R6	3M3
R7	3M3
R8	3M3
R9	4k7
R10	15k
R11	8k2
R12	150k
R13	10k
R14	150R
R15	8k2
R16	150R
R17	8k2
R18	5R 2 watt
R19	10k
R20	150R
R21	100R
R22	82k
R23	680R
R24	82k
R25	680R
R26	82k
R27	680R
R28	33k
R29	22k
R30	330R
R31	33R

All resistors  $\frac{1}{4}$  watt except R18.

### RF CHOKES

RFC 1
RFC 2
RFC 3

Wound on iron dust cores from discarded IF transformers.

### TRANSISTORS

Q1	BC 327
Q2	BC 107
Q3	2N3053
Q4	BC 327
Q5	BC 327
Q6	BC 109
Q7	BC 108
Q8	BC 327
Q9	BC 108

### DIODES

D1 - D8	1N4149
D9	1N4001
D10 - D13	1N4149
D14	1N4001
D15 - D18	1N4149
D19 - D20	1N4001

### ICs

IC1	40106
IC2	4017
IC3	TA 7313P

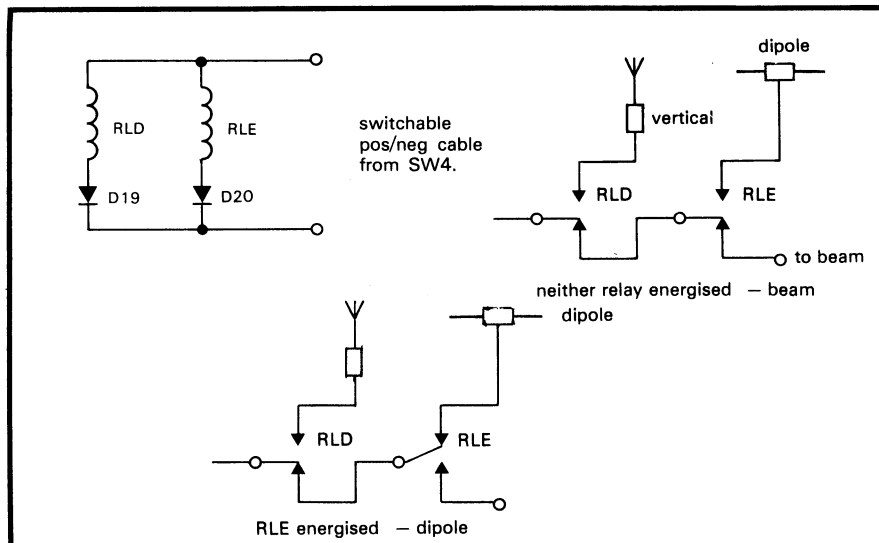
'K' which is triggered by contacts of RLA. The transmitter is held 'on' while the 'K' is being sent — by positive voltage appearing at the anode of D12. This ensures that the character is not transmitted as a 'D'.

The basic circuitry has not altered very much, some components have disappeared, others have had their values changed, one additional transistor has been added to the original circuit (Q4/Q5) to ensure snappy action of relay RLC.

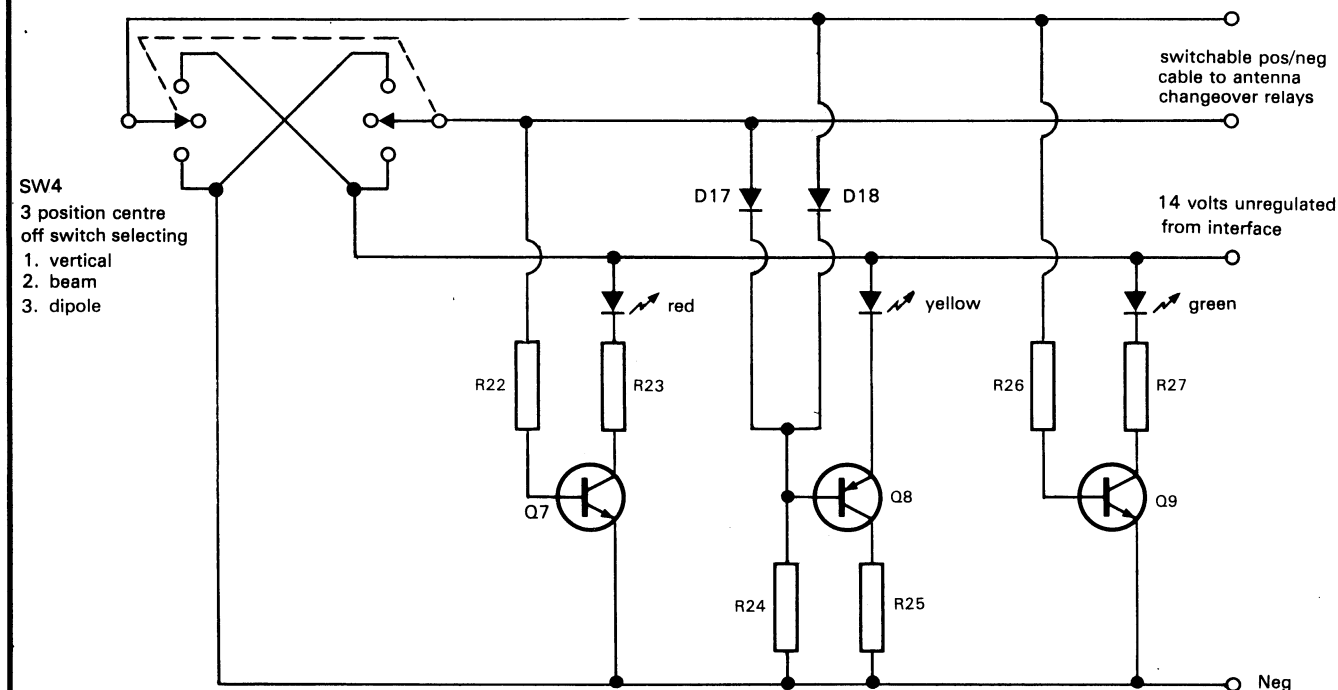
The original prototype interface was first created in January 1979, the MK 2 model evolved from it in February 1979, and now the MK 3 model has been going strong for a year since June of 1979.

From its inception to this date, not one thing has failed in the unit, so potential constructors can be assured that the project has no 'bugs'.

It can be heard in action most days around 28.490, 21.150 or 52.100 (if the band is open).



Antenna switching circuit with LED display shown top and below.



## PARTS LIST

### ZENER DIODES

ZD1 7.5V  
ZD2 5.1V

### SWITCHES

SW1 DPCO  
SW2 DPCO  
SW3 DPCO

SW4 DPCO with centre off position

SW5 part of RV3

### RELAYS

RLA }  
RLB } 6V DPCO PCB relays  
RLC }  
RLD } 12V DPCO with heavy duty contacts  
RLE }

### MISC.

LS1 speaker in IC-701 power unit  
LEDs red, yellow, green

### VARIABLE RESISTORS

RV1 220k trimpot  
RV2 1M trimpot  
RV3 5k log taper with switch



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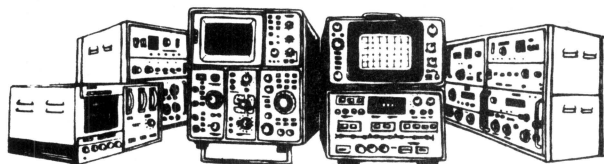
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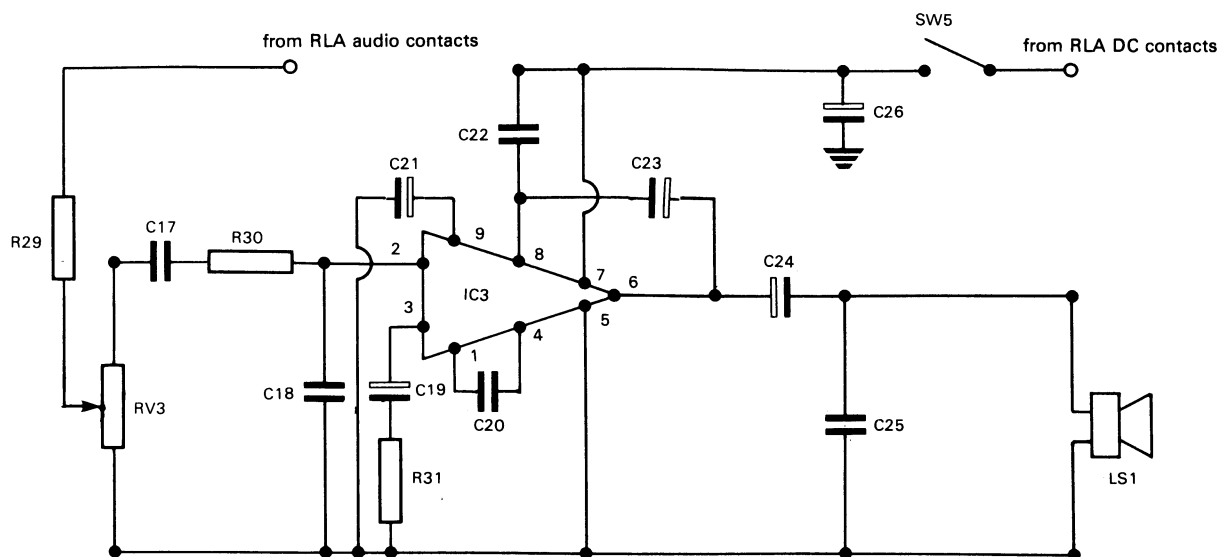
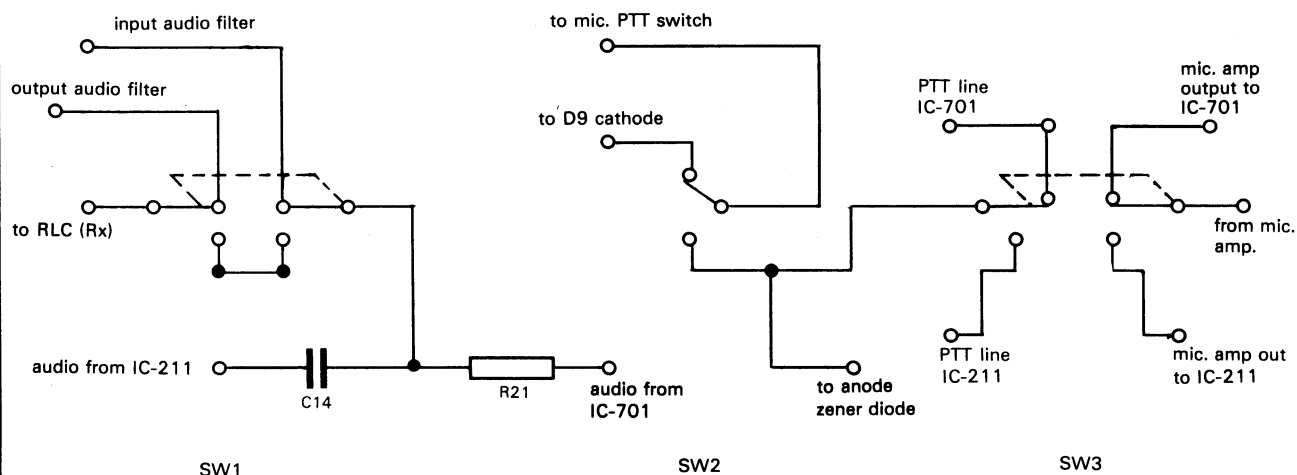
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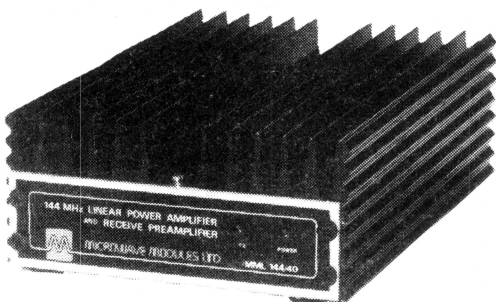
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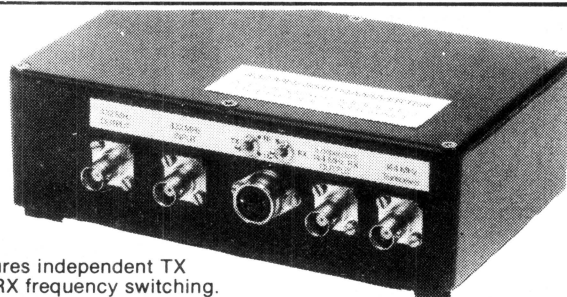
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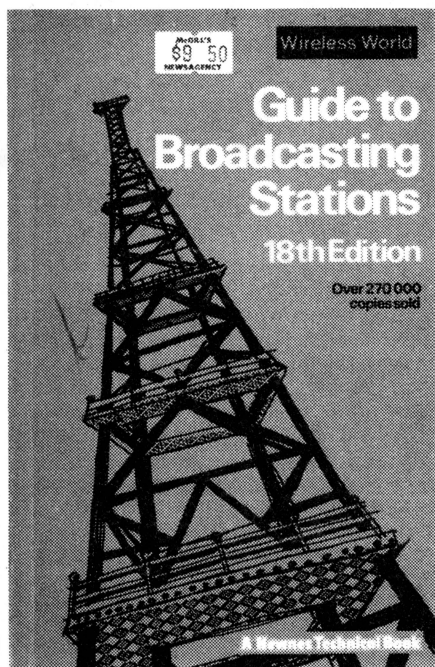
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# Book Review



## GUIDE TO BROADCASTING STATIONS — 18th EDITION

a Newnes Technical Book.  
Published by Butterworth & Co.  
Review copy supplied by McGills Authorised  
Newsagency, 187 Elizabeth Street, Mel-  
bourne, Vic. 3000.

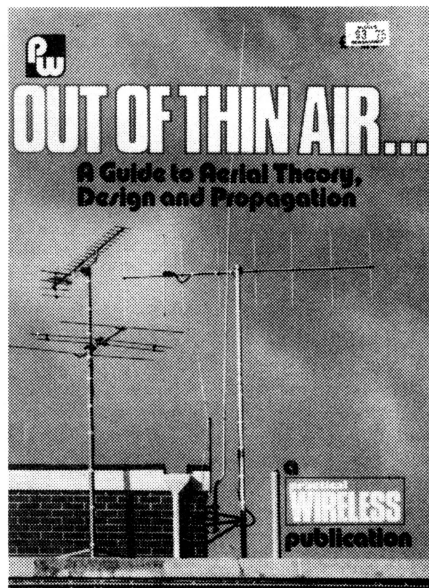
This 18th edition of the Guide to Broadcasting Stations was compiled by the English magazine Wireless World. As is perhaps to be expected, the editors have placed particular emphasis on those stations most likely to be received in Great Britain. In line with this thinking, the book includes a complete listing of European long and medium-wave broadcasting stations, listed by both frequency and location. There is also a list of VHF sound broadcasters. One would suspect that this information would have limited appeal in this country.

Of much greater use will be the introductory chapter on aerials, signal identification and preparation of reception reports.

This information is organised to give the reader a 'quick course' in the hobby of short-wave listening. Several types of longwire antennas are described, followed by a short

discussion on HF propagation. This is followed by a discussion of the various reporting codes and the proper way to draw up a reception report. This information is of some use, although the book does not list addresses for QSL purposes.

Heart of this book is the listing of international shortwave stations. As with the longwave stations, these are listed first by frequency and then by location. This listing was prepared in 1980, so it will have dated slightly, but the information can serve as a guide as to what is generally available. The serious DXer will subscribe to bulletins (and, of course ARAI) to keep up with the latest changes in broadcasting schedules, but this book should be of some benefit to the beginner who cannot afford the cost of the more expensive World Radio and Television Handbook. The price of \$9.50 is probably reasonable, just keep in mind that the information has started to date.



## OUT OF THIN AIR

Published by Practical Wireless.  
Review copy supplied by McGills Authorised  
Newsagency, 187 Elizabeth Street, Mel-  
bourne, Vic. 3000.

This soft-cover book is actually a collection of articles dealing with antennas and propagation, reprinted from the pages of the English magazine Practical Wireless. Subjects covered range from straightforward construction projects to a description by well known antenna writer F. C. Judd G2BCX of his home-built polar pattern indicator, which is capable of displaying the polar pattern of an antenna directly on the face of a cathode ray tube. Also included is an Aerial Data sec-

tion which outlines the basic theory behind a variety of antennas which have proved popular with amateurs. If you cannot describe the workings of a ZL Special or sketch out a Windom for a friend, this section should be of interest.

Construction articles heavily favour the two metre band, although there is a discussion of aerials for 160 metres, an aerial tuner and a folded collinear array which includes dimensions for a 70 cm version. Also included are articles on The Sun's Influence and a discussion of propagation research titled Path of the Waves. This later article serves as a good primer outlining the basics of propagation research.

We assume that further editions will be appearing upon the bookshelves with emphasis placed upon HF designs, accessories and so on. If they keep up the standard set by this edition, they will be most welcome. The cover price of \$3.75 points up the fact that publications from Great Britain represents great value for money at this time. If you are thinking of constructing an aerial for two metres, or want some general background reading to keep you occupied have a look for a copy.

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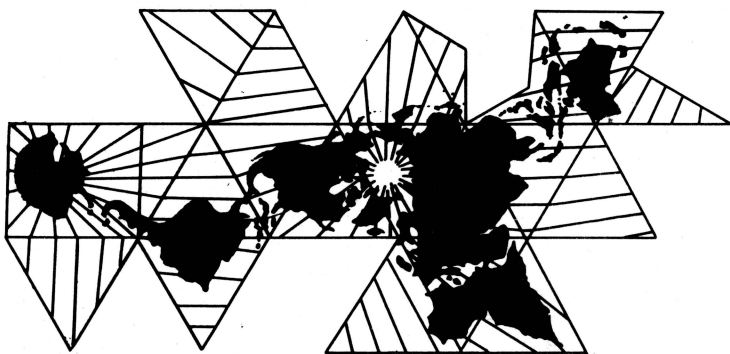
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# Work the World

by A. SHAWSMITH VK4SS

During the Northern hemisphere late summer and early autumn, i.e. August/September, there is usually a high level of activity from the European area. Contest and DXpeditions keep the bands astir and the DX-pot boiling. Because of this, it might now be propitious to publicise awards from this part of the world.

## A TOUCH OF CLASS, THE DIPLOMA INTEREST GROUP

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3. 100% QSL
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5. Be able to speak the German language.
6. One must be a member of his country's official amateur radio society — in the case of VK, a W.I.A. member.
7. Each member must comply fully with the letter and spirit of D.I.G. rules.
8. Impeccable standard of conduct and operating ability is a must at all times.

If you can meet these criteria, then you can be accepted into one of the world's most respected Ham groups. D.I.G. has quickly established itself as a top class, highly active organisation.

The D.I.G. programme is one of wide variety. There are several awards on offer and the one single impact that comes through, on viewing the certificates, is **QUALITY**. All are excellently executed on superior base paper. The two shown here are typical examples.

### W-DIG-M — WORKED DIG MEMBERS

This certificate is set out on a parchment-type base. The familiar DIG logo in centre is in red, border and some of the lettering is dark blue and the rest is in black and grey. Size 31.5cm x 24.5 cm. Requirements are:

- a. The W-DIG-M may be applied for by all licensed amateurs and SWLs who can prove contacts (observations) with DIG members as follows —

1. Class 3 — DX stations work 15 DIG members. EU stations work 50 DIG members.
2. Class 2 — DX stations work 30 DIG members. EU stations work 75 DIG members.
3. Class 1 — DX stations work 50 DIG members. EU stations work 100 DIG members.

All QSLs of DIG members listed in the DIG member list and the new DIG members published in the DIG nets are valid for this award. Expedition calls do not count additionally — **either** the home call **or** the DX call is valid.

- b. The Diploma is available for contacts on all HF bands and modes
  1. Mixed modes.
  2. CW only (CW Award).
  3. VHF/UHF bands only (VHF Award).
- c. For working 100 additional DIG members there are stickers, up to 2000 members (send SASE + 1 IRC).
- d. No QSLs are required. Send GCR list and fee of 5DM or 10 IRCs to the Award Manager:

Herbert Bernatsky DC9KR,  
Auerstrabe 15,  
D 5000 Koln 60. West Germany.

**W.G.L.C. — WORKED GERMAN LARGE CITIES** — This award is done on off-white, pliable, semi-gloss card. The border and main lettering are in rich brown, the title is green. Size 29.5cm x 22cm. Overall, it is a simple but classy-looking product and can be obtained by fulfilling the following:

- a. The W.G.L.C. is available to all licensed amateurs and SWLs who can prove contacts (observations) with amateurs in German cities of more than 100,000 inhabitants.
- b. The award is available in three classes:
  1. Class 3 — DX stations work 10 towns. EU stations work 20 towns.
  2. Class 2 — DX stations work 20 towns. EU stations work 40 towns.
  3. Class 1 — DX stations work 30 towns. EU stations work 60 towns.

In the application each city can be worked only once.

- c. The award is available for contacts on all HF bands and modes.
  1. Mixed modes.
  2. CW only (CW Award).
- d. All contacts on or after 1 January, 1962 count.
- e. Send no QSLs but a GCR list and fee of 5DM or 10 IRCs are to be sent to the Awards Manager:

H. W. Schutte DB3OR,  
P. O. Box 810660,  
D-3000 Hanover 81. West Germany.

Other D.I.G. Awards of merit are:

**DIG DIPLOMA 77** — This one is commended by DARC. To qualify, it is necessary to have worked (heard) 77 DIG members in at **least** seven different countries — but, only 7x7 (49) DIG members in the applicant's own country — after 1 January, 1977. The diploma is available for CW only (CW award) and mixed (Modes and Bands) and for SWLs (heard contacts). No QSLs, send GCR list and 5 DM or 10 IRCs to:

Henry Bielinski DC6JG,  
Alter Kupfermuhlenweg 78,  
D-2390 Flensburg. West Germany.

### INTERNATIONAL AIRPORT AWARD — I.A.P.A.

— This can be issued to all Amateurs and SWLs for proved contacts (observations) with stations in 50 different cities with an international airport. Only one contact counts from applicant's country. All six continents must be worked. Only contacts with fixed stations after 1 January, 1973, are valid. Either CW only or mixed modes. Send GCR and 5DM or 10 IRCs to Awards Manager:

Walter Hymmen DL8JS,  
P. O. Box 1925,  
D-4980 Bunde. West Germany.

**TWO MODE AWARD — TMA** — Available to all licensed Amateurs and SWLs. All contacts on or after 1 January, 1962 are valid. To qualify, you must work on CW 50 different countries, including Germany and all 6 continents — *and again on FONE* the same 50 countries (use DXCC country list). Send GCR list and 5DM or 10 IRCs to Awards Manager Walter Bielinski DC6JG (address above).

**EUROPEAN PREFIXES AWARD — EU-PX-A** — This one is yours (SWLs included) for contacts with 100 European stations with different prefixes (WPX) eg. DL1, DL2, DJ1, DJ2, F1, F2, EA1, EA2, I1, IN3, IV3, OZ1, OZ2, YU1, YU2, HB4, HB9, UA1, UA2, all prefixes of European-Russian stations and all special prefixes in Europe.

All prefixes listed in the WAE and/or DXCC country list are valid. This award is available for contacts on all bands and modes (Mixed) or CW only (CW Award). Stickers are available for additional 50 prefixes, send only SASE for these. For awards send GCR list and 5DM or 10 IRCs to Award Manager:

Alfons Niehoff, DJ8VC,  
Emst-Hase-Weg 6,



# DIPLOM - INTERESSEN - GRUPPE - DIG



## WORKED - DIG - MEMBERS

This is to certify that OM A. Shawsmith operator of amateur radio station VK 4 SS has submitted proof of contacts with 31 members of the »DIPLOM INTERESSEN GRUPPE« (DIG). Certificate number: 15 Class: 2 Date: 20.12.70 Award Manager: DL2JB

# W-DIG-M

DL 8 OT PRINT

D-4407 Emsdetten. West Germany.  
**ONE MILLION AWARD — 1,000,000** —  
 One with a difference, this one can be obtained by proven contacts with German amateurs in towns with different postal-code numbers (CIP codes). Addition of the different numbers must total at least 1,000,000. The same postal code number may be used only once. Numbers with one, two or three figures are to complete with zeros to a four digit number — e.g. 41 = 4100.

The numbers have to be listed in numerical order in the application form. See Table I for a sample.

**Table I**

Call	Date	Band	QTH	Post Code Number
DL7ZG	18.08.69	80	Berlin	1000
DL6TZ	12.11.68	40	Hamburg	2000
DL9XW	11.11.69	20	Nordhorn	4460

Total at least 1,000,000

The diploma is available for CW Only or Mixed. Send GCR and 5DM or 10 IRCs to

Award Manager:

Gunter Oelschläger DC5JX,  
 Birkenweg 15,  
 D-6108 Weiterstadt 1. West Germany.

As a final incentive, DIG offers **TROPHY-1000**. This is the highest award offered and takes the form of a handsome brass and wood plaque. To obtain it, one must have worked 1000 members and hold **all** certificates. Full information from P. Gunter DL9XW.

Besides its awards programme, DIG puts on four contests per year — two CW and two



# FOR A **BIG** SIGNAL STEP UP TO A HIGH PERFORMANCE **CHIRNSIDE** MULTY BAND OR MONOTYPE ANTENNA SYSTEM.

3el on 20M — 15M. 4el on 10M.

"Australian Made"

**NEW!**

2KW PEP.

12 Month Guarantee!

CE-35DX. 5el TRIBAND.

6M BOOM. 9.5DB GAIN. ONLY **\$299**

## MULTY BAND BEAMS.

### "Heavy Duty Type"

CE-35DX Triband 5el 6M boom 2KW PEP 9.5DB gain .....	\$299
CE-36 Triband 6el 7M boom 2KW PEP 9.5DB gain .....	\$319
CE-35 Triband 5el 6M boom 2KW PEP 8.5DB gain .....	\$279
CE-33 Triband 3el 4.2M boom 2KW PEP 8.0DB gain .....	\$249
CE-42 Duoband 4el 4M boom 2KW PEP 8.5DB gain .....	\$149
(3el 10M 3el 15M)	
CE-52 Duoband 5el 6M boom 2KW PEP 9.5DB gain .....	\$199
(4el 10M 4el 15M)	

## MULTY BAND VERTICALS

CE-5B 80M thru 10M 9M long 2KW PEP Incl. guy ropes .....

WE USE "Aluminium Brackets"  
Not "Plastic".

Chirnside antennas feature:

- High grade seamless aluminium tubing.
- Zinc plated hardware.
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- Colour code system for easy assembly.
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- Full 12 month warranty against defects parts and labour.

Send stamped SAE for brochures.

Chirnside antennas are available from  
the following interstate dealers.

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Tas.	004 311 708.
Qld.	07 352 5222.
Qld.	075 322 644.
W.A.	09 328 9229.
N.T.	089 851 643.

Type CE-5B  
trapped verticals.

ONLY  
**\$99**



## MONO BAND BEAMS.

### "Heavy duty type"

CE3-10 3el 10M/11M 3M boom 8.5DB gain els start 19MM .....	\$59
CE4-10 4el 10M/11M 4M boom 9.0DB gain els start 19MM .....	\$79
CE4-10 6el 10M/11M 6M boom 9.5DB gain els start 19MM .....	\$89
CE5-10 5el 10M/11M 6M boom 10.5DB gain els start 19MM .....	\$99
CE5-10 5el 10M/11M 7M boom 11DB gain els start 19MM .....	\$119
CE6-10 6el 10M/11M 7M boom 11.3DB gain els start 19MM .....	\$129
CE3-15 3el 15M 4M boom 8.5DB gain els start 22MM .....	\$79
CE4-15 4el 15M 6M boom 9.5DB gain els start 22MM .....	\$99
CE5-15 5el 15M 7M boom 10.5DB gain els start 22MM .....	\$119
CE3-20 3el 20M 6M boom 8.5DB gain els start 25MM .....	\$149
CE4-20 4el 20M 7M boom 9.5DB gain els start 25MM .....	\$169
CE5-6 5el 6M 4M boom 9.5DB gain .....	\$79
CE6-6 6el 6M 6M boom 11DB gain .....	\$99
Hi-Q 1:1 50 ohm balun for all beams or dipoles .....	\$18

## MOBILE HELICALS

CH-80M .....	\$23
CH-40M .....	\$23
CH-20M .....	\$23
CH-15M .....	\$22
CH-10M .....	\$22
Bumper mount to suit .....	\$9
Set of all 5 incl. bumper mount .....	\$100

All helicals are 2M long.

They are wound on 10mm solid fibreglass rods, and are finished in black PVC heatshrink.

They also feature chrome plated brass fittings, with stainless steel adjustable tip rods.

Power handling on 80M 150W PEP 40M — 10M 400W PEP.

## DAIWA ROTATORS

DR-7500R medium duty "R" .....	\$199
DR-7500X medium duty "X" .....	\$189
DR-7600R heavy duty "R" .....	\$279
DR-7600X heavy duty "X" .....	\$269

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Chirnside Electronics. 26 Edwards Road, Chirnside Park, Lilydale, 3116.  
Phone: (03) 726 7353 Please allow sufficient for freight and Insurance.

SSB — and several other on-air party-type get-togethers. It also has very popular, separate weekly Nets for both modes. It is these and other added activities which have helped DIG expand and maintain a strong bond of togetherness between members. To sum up, the DIG can only be described as a vigorous, active, progressive, high-class body of hams. If more information is required, or you have any queries write to:

DIG Secretary,  
E. Warnecke, DJ8OT,  
Postbox 10 12 44,  
D-5620 Velbert 1. West Germany

Ask for full details. You will receive several sheets in English and German on the group's activities. Include a 22cm x 16cm envelope and two IRCs.

## MEANWHILE, BACK HOME

### B.A.R.C.A. — BRISBANE AR CLUB AWARD

— This home product is available to both HF and VHF operators. The certificate is set out on a quality glossy white thin card base. It shows an aerial view of the city of Brisbane, taken from the south side of the Brisbane River and looking roughly northeast. Pictured mid-photo is the now well-known Story Bridge. Coloring is green, with black lettering. Size is 19.5cm x 24.5 cm.

You can apply for the award if you have worked —

a. The club station VK4BA and four other financial club members,

or

b. Seven financial club members without the club station.

Only contacts after 1 November 1977 are eligible.

Log extract should contain all normal information, plus membership numbers obtained (Write first for members' list including SAE).

Send with A\$1 or 5 IRCs to:

Awards Manager,  
Brisbane Amateur Radio Club,  
P. O. Box 310,  
Mt. Gravatt, Qld. 4122

Times when club members are frequently on air are as follows:

1. Sunday morning at 0930 EST after the WIA news on 21.175 MHz.
2. Monday night Club Net at 1930 EST on 28.450 MHz.
3. Wednesday night at 1930 EST on VHF Channel 50 or another Clear Simplex channel.

## THAT LITTLE EXTRA

Many complain that the cost of framing certificates is now prohibitive; several dollars each — and much more if they are professionally done. However, a little selective buying can obtain them at real bargain prices. Large supermarket and department stores hold regular sales and every so often picture frames are offered for approx \$2 or less — in finishes such as white, gold, or

woodgrain and in good large sizes up to 30cm x 25cm.

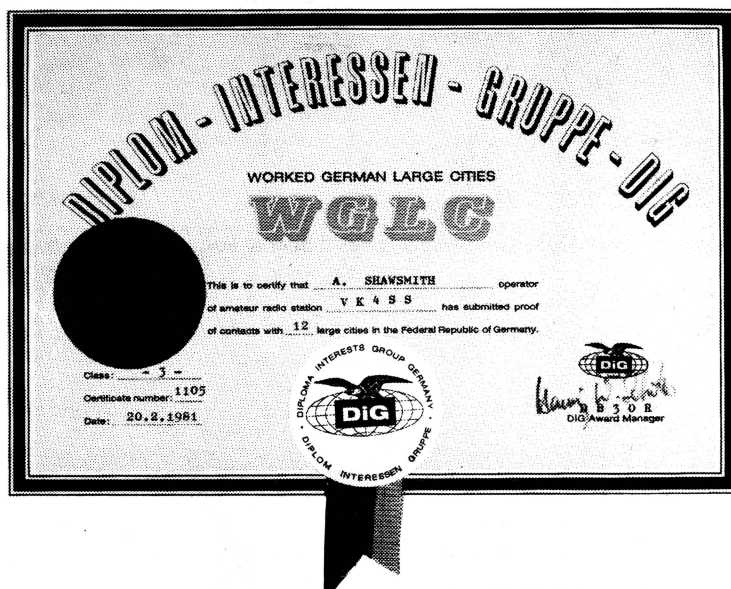
Polluted air, humidity and sunlight are destructive agents, so put your wall paper under glass or clear pastic sheet and triple its life. Only you can decide if it's worth an extra couple of bucks.

## IN THE MAIL

Karl DL1VU, who recently completed a South Pacific Island 'crawl', writes to say he managed a total of approx 17,000 QSOs —

99% CW — from seven islands — that is, A35, ZK2, ZK1, FO0, 5W1, FW0, 3D2. The jaunt was a holiday as much as a digit-swapping stint. He had a ball but arrived back home with tropic foot rot in both feet, however, he is on the mend and intends making a return trip. Next time the Tokelaus and North Cook Island will be top priority. His manager is DL2RM, QSL is 100% and via the bureau is OK but, if you want a card direct, enclose sufficient IRCs and SAE.

ARA





# Amateur Television

By RON HARRISON VK3AHJ

This month's Amateur Television column is devoted to an update of the VK4 ATVers list (again! it's all happening in the Sunshine State), some errata in a previously published circuit for jitter correction circuitry for the DG-640 software controlled VDU, an improvement to last month's circuit adapting the Sony HVC2000 PE camera to a JVC portapack recorder and the formation of a new VK2 ATV club.

In ARA Vol 3 no. 12, I presented a circuit for eliminating video jitters in the DG-640 software controlled VDU. Unfortunately somewhere along the way the pinout information was deleted.

I have this month presented a corrected circuit with full pinout information with some supplementary notes that should make the modification understandable.

I would like to acknowledge the letters I received pointing out the errors that were made in the previous issue and apologise to those readers who were confused by the original circuit.

Well it's happened at last, the Sydney area of New South Wales is finally moving on the

ATV scene, with the formation of a WIA affiliated ATV club.

Through correspondence and many phone calls from my VK2 ATV correspondent, Gary Stern VK22BB, it's obvious that enthusiasm is running high in Sydney. I wonder why it has taken so long?

Gary tells me the club has a repeater licence and by the time you read this it should be on the air from Dural, near Sydney, under the callsign VR2RTV.

To give you some insight into the VK2ATV's group activities, I have presented below a copy of its inaugural Bulletin. Note that the group's address is P.O. Box 330, Hurstville, NSW 2220.

## VK2 ATV group Bulletin

It was indeed encouraging to see eighteen people arrive for our first ATV meeting at the WIA in St. Leonards on Feb 23rd.

At the moment, we are operating as a semi-autonomous Division of the Institute, the Institute being our present advisory body.

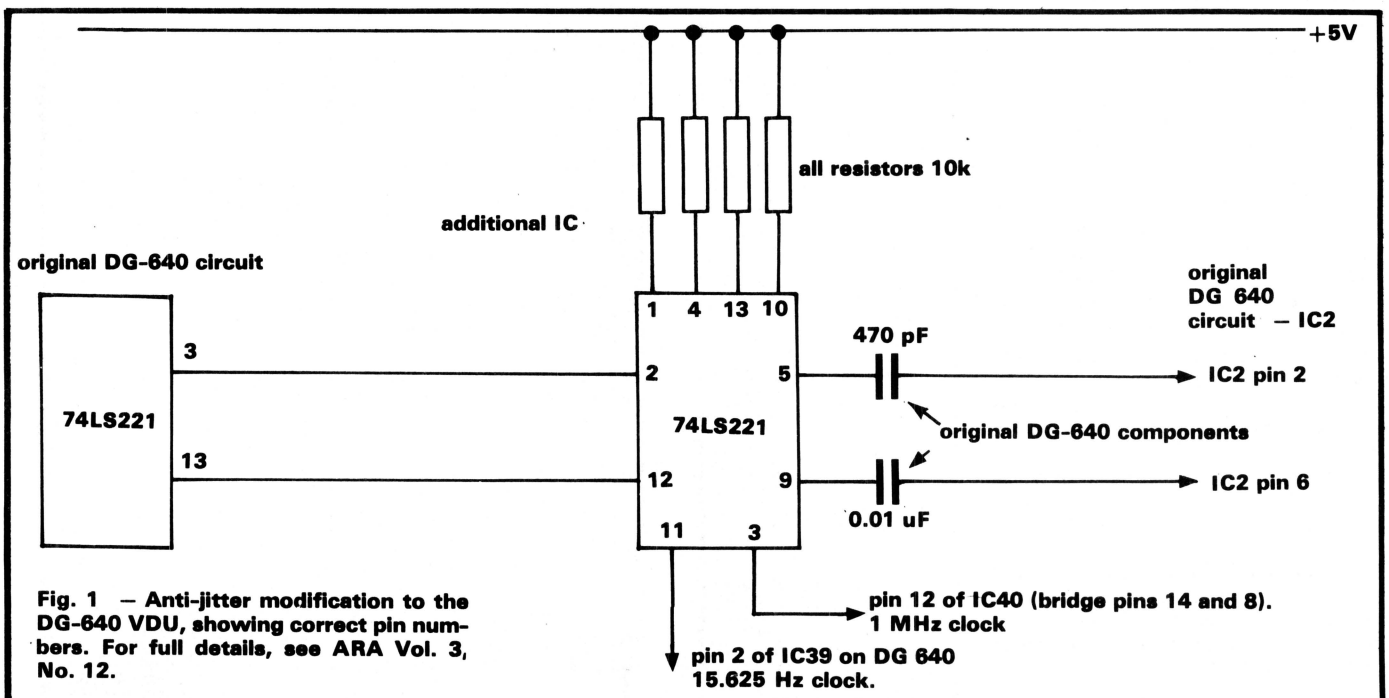
The enthusiasm displayed for our first meeting indicates that we may well be off to a fine start for 1981.

Although some may have felt a little small compared to others with what appears to be a wealth of gear, Ken VK2SD showed some goodies in the interest of most of us. A modest camera complete with lens was shown worth about \$250 along with other bits and pieces on TV nature.

Should you be one a little embarrassed for the want of good gear, we can assure you that as time progresses you'll lose that as we all give lectures all about the type of gear we all will be using, and from this, you can make your own decisions as to how you want to equip your ATV station. The first lecture to be given will be all about converters. Ian VK2ZIM will kick off for our first lecture, and no doubt we should all be informed as we need some means of displaying our outgoing pictures, as well as receiving them.

We have a repeater licence-VK2RTV-on ATV channel 2, Video 442.25, Audio 447.75MHz, with output straddling UHF channel 33/34 on 576 to 585MHz. Existing color TV receivers equipped with UHF tuners will have no trouble receiving.

Where reception may be down in the noise, a preamplifier may be needed. This may be the subject matter of a later lecture.



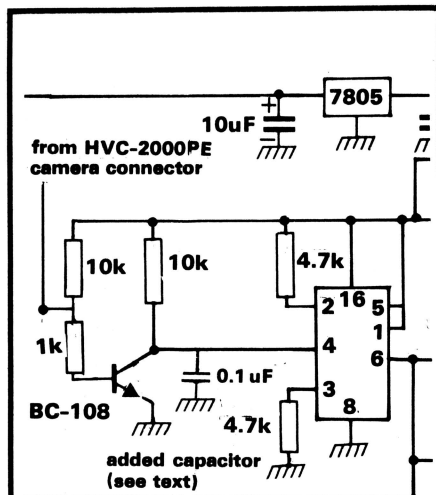


It is proposed that we each "look" at each other in "simplex" mode at the input frequency of the repeater so we can assess each others quality of transmission. In that way, we'll all be ready for the repeater when it comes to air. Although interstate have Video Carrier of 444.25, ours is licensed that 2MHz lower, and should not cause any hassles.

Our activities on both the 432 and 576MHz bands could well cement our usefulness to the authorities and justify their retention.

The rest is up to you. Whatever band you like to use, spread the word about our group and perhaps we can have a strong society like the RTTY boys.

G. F. Hughes, VK2ZNY  
President



**Fig. 2 — The amended circuit for the HVC-2000PE camera to JVC 4400E recorder adapter**

In last month's ARA, I presented a circuit adapting the Sony HVC-2000PE camera to a JVC-440E portapack recorder.

At the time the story went to press there was no indication of unreliable operation, was no indication of unreliable operation however, I have since detected a source of

This is due to interference pulses arriving at the clock input to the toggle shaped flip-flop IC (741s109). I detected this fault when testing the system on the JVC-4400E's AC adaptor. The random noise pulses were originating from the power mains.

Although the effect is not as noticeable under battery powered conditions, it can occur in portable operations near noise sources such as the power mains, motors, etc.

The problem was completely overcome by the addition of a 0.1 uF disc ceramic capacitor as shown in the amended circuit above.

The circuit also includes a few extra notes relating to areas which caused some confusion to the many people who seem interested in the adaptor to mix and match cameras and portapacks.

## VK4 NEWS

I don't know how they do it up there but the South East Queensland ATV Club has sent down yet another update for my computer printout of active VK4 ATVers.

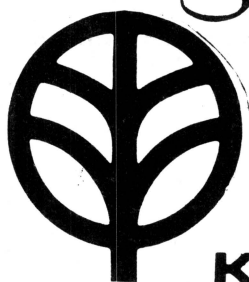
As the much extended list shows, they are collecting active ATVers at a fantastic rate up there (it must be the weather).

By courtesy of my tireless VK4 correspondent, Tom Ivins VK4ABA, here is the latest printout of Queensland ATVers.

## VK4 ATVers

VK4AG	Geoff Adcock, Kedron.
VK4ABA	Tom Ivins, Albany Creek.
VK4ACD	Cliff Danforth, Broadbeach.
VK4AGL	Joe Ellis, Nambour.
VK4AGY	Jack Gayton, Lutwyche.
VK4AHR	Bert Rumbold, Cleveland.
VK4ALG	George Lloyd, Wacol.
VK4AMY	Bob, Lunnon, McGregor.
VK4ANW	Nev Wright, Surfers Paradise.
VK4ATW	Tom Whitworth, Ferny Hills.
VK4AUS	John Bartlett, West End.
VK4EO	Ron Rich, Northgate.
VK4FE	Arthur Burton, Labrador.
VK4FM	Wayne Folan, Mt. Gravatt.
VK4IV	Fred Hayward, Wynnum West.
VK4JG	Jack Griffin, Camp Hill.
VK4KB	Ken Buckley, Nambour.
VK4KC	Dennis Breitzkreutz, Alderley.
VK4KH	Keith Hoffmann, Toowoomba.
VK4KP	Noel Mitchell, Wavell Heights.
VK4KBD	Bill Donovan, Chermside.
VK4KCB	Ron Burton, Everton Park.
VK4KJA	John Aland, Algester.
VK4KOP	Nev Mills, Thornside.
VK4KSB	Frank Barker, Redbank.
VK4KSG	Steve Griffin, Kangaroo Pt.
VK4KTQ	Peter Williamson, Albany Creek.
VK4KTV	Gary Smith, Arana Hills.
VK4KZA	David Meyrick, Stafford.
VK4MO	Ion Morrison, Manly.
VK4NCX	Troy Smith, Arana Hills.
VK4NHM	Graham Haigh, Stafford.
VK4NHV	John Hobbs, Ashgrove.
VK4NIG	Bob Godfrey, Brackenridge.
VK4NJK	Ray Jensen, Nerang.
VK4NJQ	Peter Parsons, Arana Hills.
VK4NYV	Graham Shoesmith, Albany Creek.
VK4OW	Ed White, Red Hill.
VK4PF	Ian McCosker, Surfers Paradise.
VK4TM	Trevor Meredith, East Ipswich.
VK4TN	Austin Harris, Southport.
VK4UL	Gary Trent, Castledine.
VK4VC	Ken Chiverton, Nambour.
VK4WC	Bill Clapp, Coolangatta.
VK4WS	Wayne Shaw, Nambour.
VK4ZQ	Roy O'Malley Belmont Heights.
VK4ZN	Terry Bryce, Southport.
VK4ZCL	Graham Castledine, Ferny Hills.
VK4ZFE	Frank Barker, Redbank.
VK4ZGE	Hank Schmittman, Southport.
VK4ZKE	Kevin Dalton, Redbank Plains.
VK4ZKQ	Nev Tibbits, Wynnum.
VK4ZMM	Maurice Martini, Holland Park.
VK4ZNC	Nev Cooper, Strathpine.
VK4ZNS	Ron England, Booval.
VK4ZRA	Jim Crosthwaite, Deagon.
VK4ZRI	Robert Harper, Blackstone.
VK4ZZZ	Gary Hayward, Thornside.

ARA



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Distributors of COMMUNICATIONS TRANSCEIVERS

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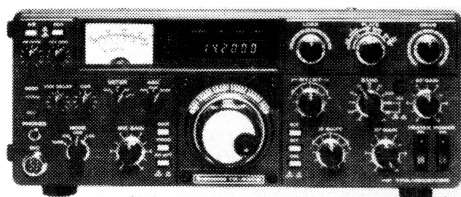
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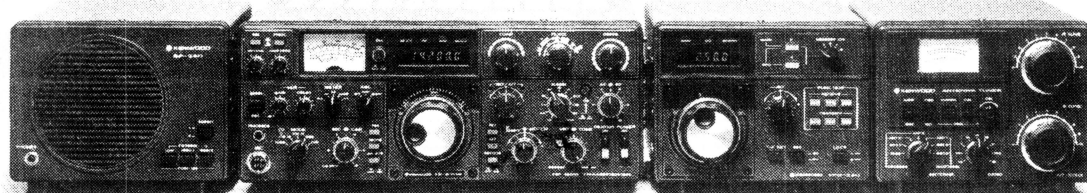
### KENWOOD

HERE IS ANOTHER GOOD REASON TO STICK WITH "KENWOOD"  
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**TS-530-S**  
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WRITE FOR TECHNICAL DETAILS ON THIS NEW "SUPER" TRANSCEIVER.



SP-230

TS-830S

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AT-230



### TS-600-A.

All mode 6m.  
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PURCHASE**

**\$499**

**SAVE  
\$400**

## KENWOOD AMATEUR RADIO EQUIPMENT



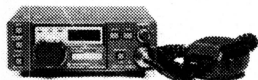
PS-30

SP-120

TS-130S

VFO-120

**DFC-230**  
Digital Frequency Controller



**HS-5**  
Deluxe  
Headphones



**HS-4**  
Headphones



**HC-10** Digital World Clock  
The HC-10 is a highly advanced world clock with dual display which can memorize 10 world major cities and 2 additional regions. This clock incorporating a precise quartz and digital display system as well as a built-in microcomputer can also recall and display the starting time of QSO for logging purpose.



**MC-30S**  
**MC-35S**  
Noise-  
Cancelling  
Hand  
Microphone



# Kenwood Tips

By Ken Woodhouse

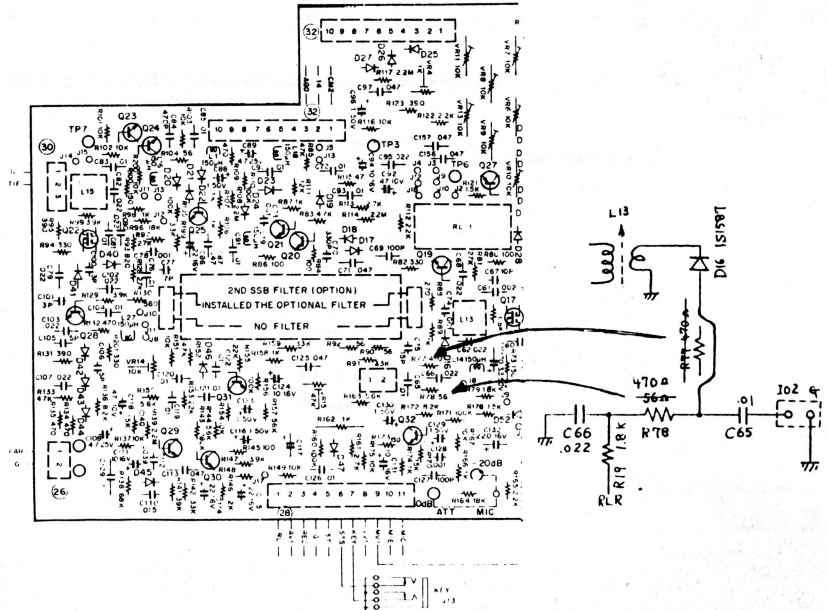
## EQUIPPING THE TS-180S FOR SCOPE MONITORING

It is often desirable to fully monitor the intermediate frequency amplifier stages of an amateur transceiver. The TS-180S is no exception to the rule, however, when connected to the Kenwood SM-220 monitor-scope it will be found that the IF output is generally inadequate for a satisfactory size display.

This problem can be easily solved by a minor wiring change requiring no additional components or circuit adjustments. Modifications are directly carried out on the IF unit — board number X48-1240-00.

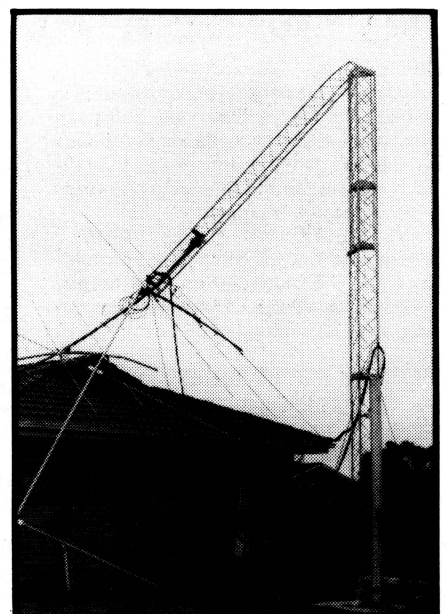
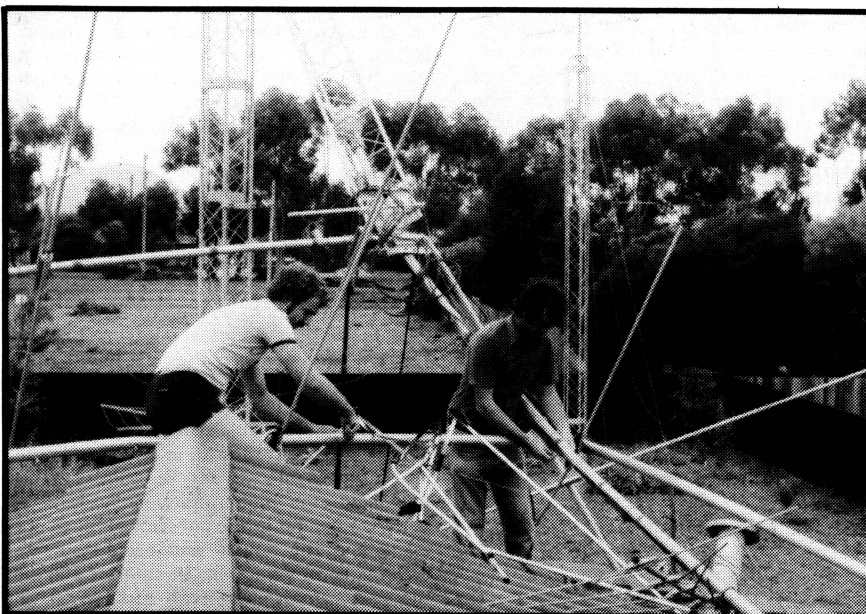
Remove the 470 ohm resistor — R77 — and replace it with a wire jumper. Next, remove the 56 ohm resistor — R78 — and replace it with R77. The 56 ohm resistor is not required and may be discarded.

To obtain a display on the SM-220 the AGC switch must be 'ON'. Circuit gain should be adequate to provide about three quarter screen display.



## Another 'Ill Wind'

*Peter James, VK3AWY from Lara, Victoria experienced the legendary 'Ill Wind' earlier this year — at least his tower felt the onslaught. His crank-up tilt over tower 'folded' over and down crashed 5 elements on ten, 11 elements on six, 7 elements on two and his co-axial vertical. Fortunately, little damage was done to his home during the storm in which wind gusts exceeded 85 kmph.*





# Competition on the air

## Contests

by ALAN SHAWSMITH VK4SS

The European late summer/autumn contest activity is again upon us. Two important events are the German and Scandinavian Tests and, to a lesser degree, the Rumanian (YO) Competition on 1 and 2 August. Participation in these 'stirs' usually helps those who are seeking countries or prefixes for the variety of European awards.

Also, closer to home, is the Phone section of the SEANET contest on 15 and 16 August (see ARA Vol. 3, issue 13) and the ALL ASIAN DX Test (A1 mode) scheduled for 22/23 August.

### EUROPEAN (or GERMAN) WAE CONTEST

#### CONTEST PERIODS

CW — August, second weekend Phone — September, second weekend RTTY — November, second weekend. Time is 0000 GMT Saturday to 2400 GMT Sunday.

#### BANDS

All bands 3.5 through 28 MHz.

#### CLASSIFICATIONS

Single Operator — All Band  
Multi Operator — Single Transmitter.

#### REST PERIOD

Only 36 hours of operation out of the 48 hours are permitted for single operator stations. The 12 hours of non-operation may be taken in one but not more than three periods during the contest.

#### EXCHANGE

Each QSO counts one point. Stations may be worked once per band. Each confirmed QTC given or received counts one point (see below).

#### MULTIPLIERS

The multiplier for non-European stations is determined by the number of European countries worked on each band. Europeans will use the last ARRL countries list. In addition, each call area in the following countries will be considered a multiplier:

JA, PY, VE, VO, VK, W/K, ZL, ZS, UA9/O.

The multiplier on 3.5 MHz may be multiplied by four. The multiplier on 7 MHz may be multiplied by three. The multiplier on 14/21/28 may be multiplied by two.

#### SCORING

The final score is the total QSO points + QTC points times the sum total of the multipliers from all bands.

#### QTC TRAFFIC

Additional points can be realized by making use of the QTC traffic features. A QTC is a report of a confirmed QSO that has taken place earlier in the contest and later sent back to a European station. It can only be sent from a non-European station to a Eu-

ropean station, the general idea being that after a number of European stations have been worked, a list of these stations can be reported back during a QSO with another station. An additional one point credit can be claimed for each station reported (note special regulations for RTTY below).

A QTC contains the time, call and QSO number of the station being reported i.e. 1300-DA1AA-134 means that at 1300 GMT you worked DA1AA and received number 134.

A QSO can be reported only once and not back to the originating station.

Only a maximum of 10 QTCs to a station is permitted. You may work the same station several times to complete this quota BUT only the original contact has QSO point value.

Keep a uniform list of QTCs sent. QTC 3/7 indicates that this is the third series of QTCs sent and that 7 QSOs are reported. Europeans may keep the list of the received QTCs on a separate sheet, if they clearly indicate the station which sent the QTCs.

#### DISQUALIFICATION

Violation of the rules of the contest or unsportsmanlike conduct, or taking credit for excessive duplicate contacts will be deemed sufficient cause for disqualification. The decisions of the contest committee will be final.

#### LOGS

It is suggested that contestants use the log sheets of the DARC or equivalent. Send large size SASE to get the wanted number of log and summary sheets (40 QSOs or QTCs per sheet).

#### SPECIAL REGULATIONS FOR RTTY

In the RTTY section of WAE (held during November) contacts between all continents and one's own continent are permitted and count one point per QSO. Multipliers will be counted according to the European and ARRL Countries List. QTC traffic is allowed between all stations (sent and received) but not between stations in different countries or multiplier areas. SWLs apply the rules accordingly.

#### EUROPEAN COUNTRIES LIST

C31, CT1, CT2, DL, DM, EA, A6, EL, F, FC, G, GC Guer, GC Jer, GD, GI, GM, GM Shetland, GW, HA, HB9, HB0, HV, I, IS, IT, JW Bear, JW, JX, LA, LX, LZ, M1, OE, OH0, OJ0, OK, ON, OY, OZ, PA, SM, SP, SV, SV Crete, SV Rhodes, SV Athens, TA1, TF UA 1346, UA2, UB5, UC2, UN1, UQ5, UP2, UQ2, UA Franz Josef Land, YO, YU, ZA, ZB2, 3A, 4U1, 9H1.

#### DEADLINE

CW — 15 September, Phone — 15 October, RTTY — 31 December

#### MAILING ADDRESS —

WAEDC Committee,

P.O. Box 1328,

D-895 Kaufbeuren. Germany.

#### CERTIFICATES AND TROPHIES IN WAEDC —

For a certificate or trophy one must gain at least 100 QSOs or 10,000 points. In addition, at least one of the following conditions must be fulfilled —

#### Certificates

1. Highest scorer in each classification in each country.
2. In countries or districts with high participation, an additional certificate will be given for each full block of 10 participants.
3. Members of the Top ten or Top six (multi-ops) list.
4. Continental winners.
5. Stations with at least half the score of the continental winners.
6. Participants with at least 250,000 points.

#### Trophies

1. Continental winners in the single-op category are awarded a plaque.
2. Continental winners in the multi-op category will be awarded a plaque if they have at least 100,000 points or at least the score of the winner in the single operator category in that continent.
3. A station may receive a plaque in the same category only once within a three year period.
4. Special plaques will be presented to all members of the Top Ten/Six if they have been in this list for at least five times.
5. The WAEDC Committee reserves the right to honor achievements of an outstanding nature by additional plaques.

**NOTE:** Multi operator/Single transmitter stations are only allowed to change band one time within a period of 15 minutes, except for making a new multiplier.

## NEW VK/ZL QSO PARTIES

It has been agreed by executives of the Old Timers Clubs of Australia and new Zealand that members of the two clubs should get together in a series of pilot 'QSO Parties' or 'mini-contests' over the next few months.

There are numerous problems associated with such an undertaking including finding dates and times which are mutually acceptable to all areas, time zone differences (four hours between VK6 and ZL), and skip distances on the higher frequencies. The experience gained in the conduct of these contests, and the advice and preferences fed back as comments with the entries will help the two groups determine the format and

frequency desired by the majority of eligible participants.

#### ELIGIBILITY

The contest is open to members of the Old Timer's Club (New Zealand) and the Radio Amateurs Old Timer's Club (Australia).

#### CONTEST EXCHANGE

Members will exchange:

1. Their club membership number, with VKs prefixed by 'A' and ZLs prefixed by 'Z'.
2. Year of first licence.
3. Name.
4. Age.  
example — Nr A 256 1951 Bill 49.  
Nr Z 128 19 23 Harry 78.

#### SCORING

Each completed exchange will score five points.

The total of VK/ZL districts contacted will be added to determine the multiplier

Final score will be Contact points times multiplier.

#### DATES AND TIMES

Contest 1 — 80 metres, Monday, 20 July, 1981 from 1000 UT to 1400 UT.

Centre frequencies will be CW 3515 kHz, SSB 3650 kHz.

Contest 2 — 40 metres, Monday, 17 August, 1981 from 0800 UT to 1200 UT.

Centre frequencies will be CW 7015 kHz, SSB 7075 kHz.

Contest 3 — 20 metres, Monday, 14 September, 1981 from 0200 UT to 0800 UT.

Centre frequencies will be CW 14050 kHz, SSB 14150 kHz.

#### ENTRIES

Claimed scores (that is contact points times multiplier) and mode used should be forwarded to the Secretaries of the respective clubs who will then exchange lists for publication of results.

Members are asked to keep the above dates before you and please make an effort to participate. Who knows, the sharing of an OTC membership number might yet be more sought after than an FOC one!

All amateurs who have been licensed for a period of 25 years or more are eligible to join the Radio Amateurs Old Timer's Club. A self-addressed, stamped envelope (9x4) to the Secretary, Harry Cliff VK3HC, P.O. Box 50, Point Lonsdale, Vic. will bring you a membership application form.

The Old Timer's Net meets the first Monday of each month at 0000Z on 7120 kHz and 0200Z on 14150kHz.

## THE AGE OF ENLIGHTENMENT

by A. Shawsmith

I can vouch for the veracity of the following, as I was on hand to hear and see it. The occasion was an outdoor Hamfest near Brisbane; can't mention the exact spot, it may embarrass someone. It was a beautiful day, so the turnout was large with just as many VK2s at 4s.

As the sun was hot, a young Ham said to his YF and five year old son, "You two give ya feet a rest, while I take a look at what's

offering at the Auction." He indicated a seat under a tree and left them.

Just sitting, dangling one's legs is plain boredom for a vigorous five year old boy, so it wasn't long before Johnny resorted to his 'comforter' — his thumb stuck in his mouth. This upset Mum who'd obviously been trying to break the habit. "Johnny," she said, "stop that!"

Johnny only rammed his thumb in further and sucked more vigorously and, for embellishment, inserted a forefinger into his nose, looking for something to pick.

"Johnny," pleaded his embarrassed mother, hoping others wouldn't notice, "will you stop that!" Then, spying an extremely obese man whose bay window was wide and low standing nearby at a retail exhibit, she added in desperation, "See that person — there. Well, you'll get like THAT if you suck your thumb."

Johnny contemplated the fat man with considerable interest, then removed the offending 'comforter'. "Ge Mum," he said, "fair dinkum?"

"Fair dinkum!" echoed Mum, pleased with her progress.

Some time later, Johnny's parents were engaged in conversation with a group of strangers, one of whom was a woman in a very pregnant condition. Noticing the boy staring fixedly at her midriff, she turned to him and enquired in a most friendly voice, "Young man, do you think you know me?"

"No, lady," replied Johnny with conviction, "BUT I KNOW WHAT YOU'VE BEEN DOING!"

ARA

★ WIRELESS INSTITUTE OF AUSTRALIA  
★ AMATE... .. RADIO!!  
★ WHAT'S MISSING??  
★ JOIN NOW, MAIL THIS FORM

To WIA, P.O. BOX 150, TOORAK, VIC., 3142

Please send me a WIA membership application form:

Name.....

Address.....

.....Postcode.....

Call Sign (if any).....

(WIA 478)



# Short Wave Listening

## NEW LISTENERS' PROGRAMME FOR RADIO AUSTRALIA

Radio Australia will introduce a new programme for the DX and shortwave listeners beginning Sunday 5 July. The new programme, to be known as "Spectrum" will be aired on the first Sunday of each month, and will be of about 16 minutes duration.

Presenter of Spectrum will be Dick Speakman, well known to many shortwave listeners for his years with Radio Netherlands' very popular "DX Jukebox" programme. Dick will present features and information under the guidance of producer Mike McCarthy, and technical adviser Peter Bunn.

Spectrum will interest not only the dedicated DXer or technical whizz-kid, but also the person with a casual interest in the international shortwave broadcasting scene. Features will include reviews of new receivers and related radio gear, news and profiles and international broadcasting stations, reports and interviews with expert DXers, news from DX clubs in Australia and overseas, and in fact anything and everything of interest to the shortwave radio enthusiast.

Exact times of Spectrum broadcasts were not available at time of writing, but the programme will be featured five times during the day, so that listeners in all Radio Australia's target areas will have the opportunity to hear the programme. The exact times of broadcasts will be announced on-air over Radio Australia during the week or so prior to the first transmission on 5 July.

Why not listen in? As this is a new programme, we welcome feedback from listeners. Your comments, criticisms, and suggestions are very much sought after, and should be sent to: "Spectrum", Radio Australia, GPO Box 428G, Melbourne 3001.

## NEW OUTLET FOR RADIO LEBANON

Radio Lebanon in Beirut has moved to the new outlet of 1790 for overseas service programmes directed to the Americas between 0200 and 0330 daily.

Last issue we mentioned another station, known as "The King of Hope," which operates in Lebanon but it is the station known as Radio Lebanon that is the official government radio organisation in that country. The new outlet of 11790 has programmes in Arabic at 0200 sign-on, then in English at 0230, followed by Spanish until close-down at 0330. There is a good deal of interference

to the frequency from the American Forces Radio and Television Service operating on the same outlet.

## BROADCASTS FROM THE SOVIET REGIONAL CENTRES

As well as operating the mammoth organisation Radio Moscow, the Soviet Union also has many overseas service broadcasts on shortwave which emanate from studies in the various Soviet republics. Early in May, both Radio Moscow and the regional radio centres introduced their frequency changes for the transmission period "J"-1981, and these changes have established scheduled for the Soviet shortwave services which will remain in force up until late August. Here now are some Soviet regional radio centres' schedules for overseas broadcasts:

### RADIO TASHKENT

Broadcasting from the capital of Uzbekistan, close to the Afghanistan border, Radio Tashkent broadcasts mostly to South Asia, but still offers good reception in Australia also. Tashkent has the following English broadcasts daily:

1200-1230, and 1400-1430, with both services broadcast on 15460, 11785, 9750, 9715 and 5959.

### RADIO KIEV

From the capital of the Ukraine, Radio Kiev has three programmes daily in English for overseas listeners in Europe and the Americas. Most of these transmissions are received in Australia also.

1900-1930 on 11880 and 9560.  
2330-0000 on 17870, 17845, 15180, 12060, 11735, 11690 and 9800.  
0200-0230 on 17870, 17845, 15515, 15180 and 11735.

### RADIO VILNIUS

From the Baltic republic of Lithuania, Radio Vilnius broadcasts one daily programme in English, directed to North America. Most of their frequencies are also well heard in Australia via the long propagation path across the Americas and the Pacific. The programme is on air:

2200 to 2230 on 17870, 17845, 15180, 12060, 11735 and 11690.

### RADIO YEREVAN

From Armenia, Radio Yerevan has just one daily service in English, between 0230 and 0300, broadcast on 17870, 17845 and 15180. This half-hour segment includes features in the Armenian language also.

As can be seen, some frequencies are common to several stations. This is because although the programming originates from the respective local studios, the transmitters

over which the programming is beamed may be located anywhere in the Soviet Union. In fact, with the possible exception of Radio Tashkent, most of the regional transmissions listed above are beamed via transmitters located outside the republic from which the programming originates. For example, some of the transmitters used for Radio Kiev's broadcasts are probably located near Moscow.

## PERU LOCAL ASKS FOR REPORTS

When a small Latin American station starts announcing on-air that it wants to receive reception reports from listeners, DXers everywhere sit up and take notice!

Radio Atlantida in Iquitos, operating on 4790 on the 60 metre tropical band, has recently been requesting reports. The station has recently installed new equipment, and is anxious to know if any improvement in reception has resulted. The station is currently heard in Melbourne between about 1030 and 1140 with fair to occasionally good signals.

DXers wishing to increase their tally of Latin American verifications should not let this chance slip, for unlike the large international broadcasters, the local stations in Latin America have no practical use for large quantities of mail from overseas listeners. They are concerned primarily with their local audience, and whether their signal is heard in Australia or not usually isn't of vital importance to the majority of stations.

Send reports to: Radio Atlantida, Apartado 786, Iquitos, Peru.

## LATEST FROM THE VATICAN

The recent attempt on the life of Pope John Paul II has created a great deal of interest in tuning into the latest news from Vatican Radio.

The Vatican has a daily transmission beamed especially for reception in Asia, Australia and New Zealand, which is on air 2210 and 2230 on outlets of 15120, 11830 and 9615. The transmission commences with a new bulletin and usually features news of the work of the Catholic Church around the world.

## FROM GERMANY EAST AND WEST

Both East and West Germany beam daily transmissions to our general region, in both English and in German.

West Germany's Deutsche Welle has two daily English programmes for East Asia and



# Short Wave Listening

Australasia. There is a morning service 2100-2200 on 7130 and 9765 and an evening broadcast between 0930 and 1030 using outlets of 11850, 15160, 15275, 17780, 17800, 21540 and 21680. Deutsche Welle's Sunday evening service includes the programme 'Asian Report', while the Saturday morning service features the letterbox programme "Yours sincerely."

Meanwhile, East Germany's overseas service — known as "Radio Berlin International" — beams several daily programmes in English to South East Asia. There is no service specifically beamed to Australia, but the timings of the South East Asia broadcasts make these an Australian service in all but name. English programmes, all 45 minutes in duration, are broadcast at 0545 using 17700, 21465 and 21540. At 1100 using outlets of 15320, 17700, 21465, and 21540. At 1300 a further English programme is broadcast on 17700, 21465 and 21540, while at 1400 both 17700 and 21540 carry the final English service to South East Asia for the evening.

Both Deutsche Welle and Radio Berlin International publish interesting periodicals which they will send upon request free of charge to listeners. Deutsche Welle publishes "Hallo Friends" each two months, an 8-page leaflet giving details of developments in German radio and in daily life in West Germany. Radio Berlin publishes "RBI Journal" quarterly and this will be despatched free to any listener who writes requesting it. RBI Journal provides much information about daily life in East Germany. Both Hallo Friends and RBI Journal include up-to-date transmission schedules for the respective stations.

Deutsche Welle has the address: PO Box 10 04 44, Cologne 1.

Radio Berlin International has the address: DDR-1160, Berlin.

## NEW TIME FOR ENGLISH FROM ANGOLA

A rescheduling of the English language service by Radio Nacional de Angola in Luanda has English daily from 2230 until 2300, and currently this programme is broadcast on 7245, 9535 and 11955.

Probably the best outlets to monitor are 7245 and 9535, as 11955 suffers a great amount of interference from other broadcasters. These frequencies previously only carried the English programme during our local evening period, meaning propagation could never occur into Eastern Australia as at that time there is always far too much daylight on both the short path across the Indian Ocean and also on the longer pro-

pagation path over the Americas and the Pacific.

## NEW HIGH POWER TRANSMITTERS FOR NIGERIA

The Voice of Nigeria has written to advise that the installation of three new 500 kilowatt shortwave transmitters at the Ikorodu site near Lagos is now complete.

These transmitters are now in use on frequencies of 7255, 11770, and 15120.

Voice of Nigeria has an English language service to Australia, at the unusually late time of 1410-1530 daily, using one of the 500 kilowatt transmitters operating on 15120. It seems a strange move to broadcast to Australia after our local midnight, or perhaps in Nigeria we Australians have gained a reputation as insomniacs!

More conveniently timed English broadcasts from Lagos via the new transmitters are 0500-0600 and 0800-0900 using 7255; 0600-0800 and 2100-2200 using 15120 plus 17800; and from 1700-2100 using 11770.

According to Voice of Nigeria's Mr J. O. Kunrunmi, the station is keen to receive reception reports, particularly for frequencies on which the new high-powered transmitters are being used.

Address reception reports to Voice of Nigeria, Broadcasting House, PMB 12504, Ikoyi, Lagos. All correct reports will be verified by QSL cards.

## SOME CHANGES AT ITALIAN RADIO

Radiotelevisione-Italiana (RAI) in Rome is not known for making sweeping frequency changes at the start of each new transmission period. The "J"-1981 period, which will be effective up to the end of August, shows several moves for RAI services of interest to Australian listeners.

RAI's Italian language service to Australia each morning at 2050-2130 has moved from 15405 to 15400 while 11800 and 9575 remain unchanged.

During our winter months, RAI's English language service beamed to South Asia should be well heard during the period 0350 to 0410. Recently, this programme has moved from 21560 down to 11905, while the service is also broadcast on the unchanged outlets of 17795 and 15330. Frequencies for most other English services of interest to Australian listeners remain unchanged, and the closest RAI comes to an English programme to Australia is the one directed to Japan from 2200 to 2225 daily, broadcast on 15330, 11800 and 9710.

## FIRST EDITION OF HANDBOOK SUPPLEMENT NOW AVAILABLE

The May edition of the World Radio and TV Handbook Newsletter is now to hand.

This Newsletter is published in Denmark three times a year, in May, August and November, as a supplement and updater to the very popular World Radio and TV Handbook which is published each year in about late January or early February.

The current Newsletter provides the "J"-1981 transmission schedules for the major international broadcasters, effective until the end of August. Information is set out in regional and country order as in the World Radio and TV Handbook, for ease of cross referencing and alteration of the Handbook information.

DXers who would like a copy of the Newsletter should write direct to the World Radio and TV Handbook, PO Box 88, 2650 Hvidovre, Denmark.

Remember that as well as co-ordinating Australian orders for the annual World Radio & TV Handbook, the Australian Radio DX Club also takes orders for the set of 3 newsletters. Orders for the Handbook and the newsletter updaters are taken towards the end of each year. Watch this column for news on how to order these essential DX publications.

## WEATHER BUREAU BROADCASTS

One of the very few weather bureaux in the world to operate a shortwave broadcasting station for general reception, if not the only bureau, is the Turkish State Meteorological Service in Ankara.

This organisation operates with a 2.5 kilowatt transmitter on 6900, and broadcasts Turkish music together with regular weather news reports. The station is known as the "Voice of Meteorology" and the Director-General, Major-General (Retired) M. Cemil Ozgul, advises that they use a delta matched antenna fed by open wire balanced 600-500 ohms line. The antenna is 28 metres long and positioned at a height of 17 metres.

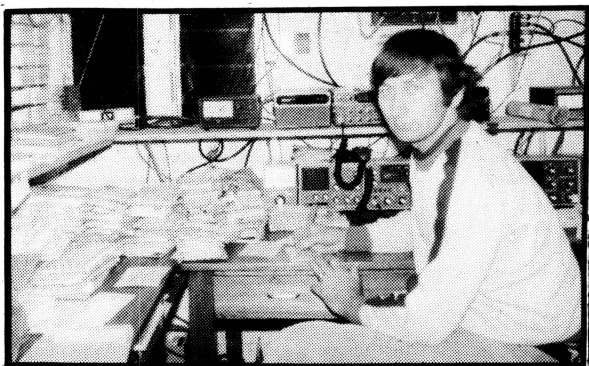
Broadcasting times for Voice of Meteorology are currently: 0358 to 0600; 0700 to 0840; and 1100 to 1550 daily.

The station is often heard in the 1400 to 1550 time period in Melbourne, and the station will verify correct reception reports which should be sent to: Turkish State Meteorological Service, P.O. Box 401, Ankara.

Compiled by Peter Bunn, on behalf of the Australian Radio DX Club (ARDXC). Enquiries regarding membership of ARDXC are welcome, and should be sent to: PO Box 227, Box Hill, Vic 3128 with a 22c stamp.

**A R A**





# Spectrum

Compiled by Steve Gregory, VK30T,  
P.O. Box 622, HAMILTON. VICTORIA. 3300.

*Times are in GMT unless otherwise noted.*

## BURMA COMES ON AIR!

With virtually little or no warning, Hiro JA8BMK arrived in Rangoon and proceeded to activate 20, 15 and 10 metres under the callsign XZ5A. The first contacts were made on Thursday, 21 May on 20 while I found him on 21.270 at 06:00 on 25 May.

Travel arrangements were being made with JA1BRK followed by a short period of working transceive into Oceania. About one hour later the station commenced to work split between 21.3 and 21.270 into most Pacific areas.

Signals were never really strong and I am told that only a dipole antenna was used for 15 and 10, with a three element beam on 20 metres. I believe that the station was manned by two Japanese operators under the supervision of a local enthusiast. Frequent long interruptions to transmissions were apparently caused by poor power facilities and also the necessity of military communications from the same station or area where the trio were allowed to set up the amateur station.

It is not known whether there will be future operations from Burma, but this is the first in nearly 20 years and an encouraging sign that the government might be relaxing its views towards private radio transmitting from the country.

JA1BRK did indicate that the equipment was to be donated to the authorities and possibly others would get to use it in due time.

To those that missed out, it is through no fault of your own. The hours of appearance were mainly in the middle of the night or midday, when most were inactive.

The usual pushing and shoving on the frequencies when they did appear was in evidence as usual, with more than one or two showing their selfish interiors by continuous calling and disruption of the liaison with JA1BRK. Still, under the extreme provocation of number two most wanted in the world, I guess it was to be expected.

To the lucky ones, congratulations and send cards to JA8BMK, Hiroto Sasaki, PO Box 159 Asahikawa, Hokkaido Island, Japan 070-91. QSL Manager is JA1BRK, 5-4-18 Zaimokuza, Hamakura, Kanagawa, 248, Japan.

## STOP PRESS

Jim JA8BMK and YAS JA8BKM returned from Burma in early June without trouble. They report that amateurs should look for further Burmese operations every Saturday on 14.170 MHz between 1400-1500 GMT. Full documentation has apparently been sent to the ARRL. The address for XZ5A is now Winka, Kawthoolei, Eastern Burma. Thanks to JA1BRK for this info.

## MORE PHONEY CARDS

As a direct result of U.S. Amateur operators perpetrating phoney cards for DXCC credit from VKOPK and VKORM, the ARRL has uncovered a QSL card printing racket originating in Southern California.

A detailed list of the phoney cards printed

will be issued in June QST along with a strong editorial regarding the offenders.

All DXers are warned that they may have phonies in their collection, though just how is not known. The main consideration is the source of the long awaited card, should it come from some other amateur.

A recent example was the cards for UA1PAL from UA4HLK, if you ever got one from UA0OSM, he had a small stamp on the back saying effectively that if this stamp was not on the card then it was not the genuine article.

Ken VK3AKK made sure that the ARRL had a complete list of the few who worked Heard Island, so the W6 who used a card sent for display purposes for credit was just plain stupid.

As for the guys who are printing the phoney baloney cards, all I can say is 'sick'.

## QSP. QSP. QSP

Canton. KS6DV was held up from KH1 due to transport problems.

South Cook. Dick ZK1AR frequented the 21.202 Net late in May while on holidays. Cards go to AA6Z.

Guinea. Ian VK4NIC should be home by now but I read that W4LZZ was taking gear there late in May. No reports on activity yet.

Guinea-Bissau. Eric, SMOAGD says 20,442 contacts were had on all bands and modes during their operation in April.

Thanks go to Hillar, now J5HTL who was instrumental in getting the group on the air. With equipment donated, Hillar will activate 15 and 20 metres for a further 12 months, at the time of writing. Power is rationed in Bissau for 10 hours each day so emergency power is the normal means of gaining air-time.

Cards to SM3CXS, Joergen Svensson, Berghemsvagen 11, s-86300, Sundsbruk: ZM7, Tokelaus. By VK9NS, 2BKD and 2BJL irrespective of the plans of 4Z4TT, mid June via 'Banyandah' and KB7NW. Besides the trio will be better equipped, more efficient in operation and the card won't cost you near as much when confirming ZM7. Jim says he is taking IC551 and beam for 6 metre operation also.

VK9ZD. For 40 metre confirmation try 7095/7205 EAST mornings; Dave is QRT on 14 July, with no named replacement oper-

ator. All equipment will be removed from the Island, including 6 metres, so if you know you are going there, let me hear from you so arrangements can be made to leave the 6 metre station behind. Telephone (055) 723 333.

Brunei VS5RP Bob, skeds W0YK on 80 metres at 11:30 around 3505 CW. VS5DX cards for 6 metres are showing up around VK.

Singapore. 160 metre enthusiast 9V1UY has been up on 1.803 MHz between 12:00 and 12:30, with a shift to 3503 at 12:30 and to 14.018 at 14:00 for CW buffs.

KV4AD/PJ6 signs from Saba also under PJ6MN, a friend's home call.

K4YT. As of June first the following whistle stop itinerary for his next African jaunt. ZS6, A22, 7P8, 3D6, C9, 5R8, 3B8, 7Q7, 5H3, 9J2, 9X5, 9U5, 5Z4, 5X5, ET3, 601 and SU. No word about callsigns, dates or operating possibilities. Just watch out!

Also to Africa. . . W8HMI arrived in Liberia late May and thence to 5Z4, 9J2, 5H3 and 601 (where he previously held 601AU), 5Z4 and ST2. He has two rigs on board and will concentrate on 20M SSB. Somalia expected early to mid June.

CE0X. Rumour has it that Bob, 9K2FF (SVOBV) has a contract to install equipment on Chilean territorial Islands including CEOX in September.

TY9ER recently active, by DJ2BW and DL8DC, complemented TYA11.

As QRZ DX points out, this hobby of ours is not a life or death battle just to get up in the 'top ten'.

If you don't have an XZ card in your file, so what? Is it worth losing your self respect over?

## UN-DU AWARDS

This attractive certificate has been available since August, 1977 but the first certificates have only just been awarded. Peter K6EDV was lucky number one for working the required 100 United Nations.

Information about the award can be obtained from Nick DU1BOS, Award Manager of the Philippine Amateur Radio Assoc., Box 4083, Metro Manila, Philippines.

The first ten winners were . . . K6EDV, K9ND, JK1NCS, K5OVC, WA1-JIR, K1RH, K0BD, JA6CNL, EL9A and PAOMA.

Please allow adequate postage for the award, which measure 2 feet by 1 feet in size, encompassing all the flags on the 100 member nations.

## KP4 DESECHEO

The operation from Desecheo, KP2A, from June 8-15 was officially sanctioned by the IDXF and cards should go to Jay Musikar AF2C, RFD 2, Putnam Valley New York 10579.

The ARRL has only ever recognised one operation from this rare location and that was KP4AM/D in the ARRL DX Competition in 1979 (Handy).

The IDXF is the first to obtain permission, of the many who have applied since that time.

Over 12 months ago Desecheo received 'country status', being one of the last to be granted same by the ARRL DXAC.

On the world wanted list, it was number 116, but recent influx of new amateurs should have raised its status by now.

Several sources show that KP5 was allocated as the prefix, but TDXB says that this is incorrect and it is unlikely that such a prefix will ever be issued.

## PERMANENT PREFIXES

Countries that have permanently changed prefixes lately at Nicaragua to HT and East Germany to Y. No FS7 licences have ever been issued for French St. Martin and FG/FS7 seems to be the normal signing call.

## COCOS/KEELING

Alex VK9CCT has been heard signing VK9YA, but no other details. VK9NYG has found it hard going since 28 MHz went flat, but intends to sit the full exam and 10 w.p.m. morse soon.

A TET triband beam has been donated to the island group and should arrive soon.

No details on the planned operation by the VHF operator VK9ZYG.

It is a pity that we have to read about our own territorial operations from overseas publications. Remember NO INPUT = NO OUTPUT = NO QSOS.

A letter from Darwin requesting informa-

tion for a future operation from Christmas Island has been forwarded to VK9XW for processing. If it goes ahead the VK8 operator will visit Christmas in mid-September after returning from leave in Europe via Singapore.

Equipment will be Icom and the call VK9XN.

## QSL TY?

TYAA11 cards go to ON5NT except for guest operator contacts such as K4YT who has his brother W2TK as manager. TY9ER cards go to DL8DC for the operation by him and DJ2BW.

## ALAND ISLANDS.

If you still have not managed to confirm this Scandinavian rock then try all bands during the Radiosport contest in July.

KR6Q, K6TMB and KS6O together with SM0CCM will operate between 8 and 13 July including the ARRL contest period.

Cards all go to respective home callsigns signing /OH0.

## OY5 Faroes.

A guest operator during July will be W1TJI signing either portable or under an OY callsign. Leon will operate with an OMNI-C and Clipperton L on 10/15 and 20 with dipoles only.

He plans to concentrate on CW contacts but will sked for phone.

## CE0A.

The grand opening of the club's first radio station will occur about September first for one week of activity on all bands INCLUDING 6 metres.

## Seychelles.

W2PN skeds, Bill S79WHW daily on 14.254 between 03 and 04:00. Bill also frequents 21.275; QSL with US direct, to Mahe.

## ZL3AFH/A.

Try Thursday at 09:00 on 14.320 and Fridays at 02:00 on 21:300.

## ZL1AMO/LH.

During weekend of ARRL Radio Sport contest on CW, first weekend in July.

## VP8AEN.

What country, anyone know? Some say South Georgia, the Yanks say South Shetland.

Work first and ask GM3ITN, who is the manager.

## TURKEY . . . NOTE WELL.

Send only to special post office boxes with 4 IRCs and addressed envelope.

No callsigns on the envelopes PLEASE!

Use only latest callbook and associated PO Box.

If you haven't got one ASK SOMEONE.

Do not send a tucked in flap envelope.

NO SWL CARDS.

TA SOCIETY Bureau is NOT in operation, so don't send cards there.

The ONLY TA Hams with managers are TA2KS and TA2BAV.

Thanks to WA2BAV (TA2BAV).

## SCOOP!

News that Ed W4MGN will also operate from some rare countries in Africa during June, July and August was most welcome.

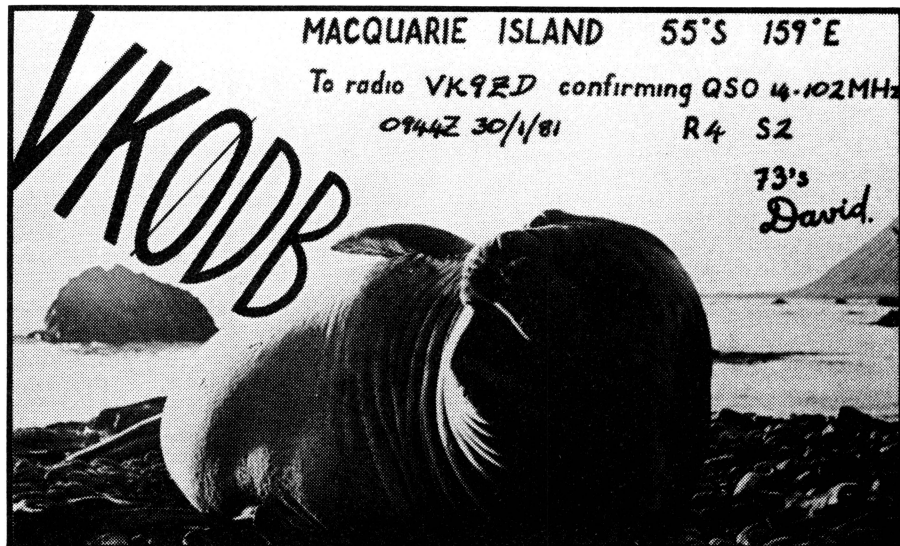
19-26 June, 6W8HL; 26-6 July, TR8DX, possibly also TL8; 6/7 July 9Q5; 7-15 July 9U5JM, 15-18 July 9X5MH, 18-23 July 5Z4RL; 23-29 July EL2AV and 29 July to 10 August C5ACC.

Ed will concentrate on 40 and 80 metres as well as VK/ZL contacts on 20 metres around 08:00 daily. Frequencies to watch are 14.185-.195 as well as CW on .025.

From C5ACC efforts will be made to accommodate those stations which require a CW contact.

You may or may not know that the ARRL is not accepting credentials for 9U5JM, the WIA however will accept cards from Ed's operation from Burundi.

Thanks to VK3AKK.





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## APRIL — We announced bargains on ANTENNAS and ROTATORS

**RESULT — Rotators — T2X Tailtwister and Ham-IV sold out. KR-400 — a few left at \$120. Antennas — TET HB35C — a few left at \$360. Cushcraft A3 — a few left at \$260. HY-GAIN TH5-DX — one left at \$370. HY-GAIN TH3-JR — a few left at \$220. HY-GAIN 18-AVT/WBa — a few left at \$110. THEY WON'T LAST MUCH LONGER . . . BUY NOW AT THE GOOD PRICE."**

### ANTENNAS

TET HB35C log/yagi 10-15-20M 13' boom.....	\$360
HY-GAIN TH5-DX yagi 10-15-20M 18' boom.....	\$370
CUSHCRAFT A3 yagi 10-15-20M 14' boom.....	\$260
HY-GAIN TH3-JR yagi 10-15-20M 12' boom.....	\$220
HY-GAIN 18-AVT/WBa 10-80M vert. 25' tall.....	\$110
HY-GAIN GPG-2 2M vert. 5/8W 3-4db gain.....	\$22
HF Helical whips 10-15-20-40M each.....	\$25
HF Helical whip 80M.....	\$30
SPECIAL PRICE for set of whips w/bumper mount and spring base	
	\$120

### MULTIMETERS - DIGITAL

DT-810 LCD readout 16 ranges colour coded.....	\$95.00
DT-820 LED readout 16 ranges colour coded.....	\$75.00
CC-01 Carrying case.....	\$4.00
UP-11 hFE Probe.....	\$3.00
UP-12 IC clip leads.....	\$2.50
UP-13 Universal test lead kit.....	\$5.00

### MULTIMETERS - ANALOG

DT-1313 19 ranges colour coded.....	\$30
DT-1314 38 ranges colour coded.....	\$35
DT-1316 36 ranges colour coded.....	\$40

### ACCESSORIES

CNA-1001 Daiwa 250W auto ant. tuner.....	\$250
MK-1024 elect. keyer w/programmable memories.....	\$195
JACKSON CURRENT SENSING CAR BURGLAR ALARM.....	\$45
POWER SUPPLIES 240/13.8V DC:	
2A regulated current limiting protection.....	\$35
4A regulated short circuit protected.....	\$55
6A regulated short circuit protected.....	\$75
ASAHI TYPE bumper mount.....	\$6.00
STANDARD BUMPER MOUNT COMPLETE.....	\$5
HD SPRING MOUNT w/SWIVEL BALL MOUNT.....	\$15.00
HD SPRING MOUNT.....	\$10.00
SWIVEL BALL MOUNT.....	\$5.00
HD GUTTER MOUNT 3/8" 24 thread base.....	\$7.00
MIRROR/ROOF BAR MOUNT WITH BASE.....	\$6
MAGNETIC BASE w/CABLE & PLUG.....	\$16.00
MAGNETIC BASE w/out CABLE.....	\$15.00
STANDARD MARINE BASE.....	\$5
SLOPE ADJUSTABLE MARINE BASE.....	\$5
ADAPTORS 3/8 stud.....	25¢
ADAPTORS DOUBLE MALE 3/8"-5/16".....	40¢
ADAPTORS DOUBLE FEMALE 3/8"-5/16".....	70¢
ADAPTOR 3/8" Male-5/16" Female.....	70¢
COAXIAL 3-way push button switch.....	\$15.00
DUMMY LOAD 30W to 150 MHz.....	\$12.00
5-SECTION LP FILTER KENWOOD & SIMILAR.....	\$25.00
YM-37 YAESU 8 pin standard mic.....	\$15.00

**ROTATORS** - All rotators complete w/bottom mast bracket and for 28V AC operation  
KEN KR-400 MEDIUM DUTY brake pwr 1300 in/lb.....\$120

### CABLES & BALUNS

RG8/U quality coax cable 50 ohm per metre.....	\$1.25
RG 213/U quality coax cable 50 ohm per metre.....	\$1.50
RG58A/U quality coax cable 50 ohm per metre.....	50c
RG 58C/U quality coax cable 50 ohm per metre.....	60c
6 core rotator cable per metre.....	75¢
BN-86 balun 50 ohm 1:1 1KW.....	\$25.00
HL-Q balun 50 ohm 1:1 1KW.....	\$15.00

### TRANSCIEVERS RECEIVERS ACCESSORIES

Yaesu Musen, Trio-Kenwood and Icom equipment available plus accessories. Ring, write or call in for information brochures and prices.  
KYOKUTO FM-2025A Mk 2 transceiver 2M FM10 memory 25W scanning.....\$340

### SWR/POWER/FS ETC. METERS

JD-110 SWR/PWR/FS (black) 1.5-144 MHz.....	\$15
JD-111 SWR/PWR/FS (silver) 1.5-144 MHz.....	\$15
JD-140 Antenna matcher 100W 25-40 MHz.....	\$15
JD-171 SWR/PWR/FS 1.5-144 MHz.....	\$20
JD-175 SWR/FS/ant. matcher 1.5-144 MHz.....	\$25
JD-176 SWR/PWR/FS/Matcher 1.5-144 MHz.....	\$35
JD-178 SWR/PWR/FS/MOD/MATCHER 1.5-144 MHz.....	\$40
JD-181 SWR/PWR/FS 1.5-144 MHz.....	\$15

### MARINE TRANSCIEVERS

2W 3 ch. hand-held w/crystals.....	\$70
5W 6 ch. hand-held w/crystals.....	\$115
5W 6 ch. mobile w/crystals.....	\$130

### CONNECTORS

PL-259 RG-8U and RG-58U types each.....	.75¢
SO-239 1, 2 or 4 hole mount each.....	.75¢
RIGHT ANGLE connectors.....	\$1.50
T-CONNECTOR 3 x SO-239.....	\$2.00
T-CONNECTOR 2 x SO-239, 1 x PL-259.....	\$2.00
PL-258 Double female 2 x SO-239.....	.75¢
DOUBLE MALE 2 x PL-259.....	.75¢
UG175/U reducer for RG-58U coax.....	.20¢
UG176/U reducer for RG-59U coax.....	.20¢
ADAPTOR RCA male to SO-239.....	.75¢
LIGHTNING ARRESTOR PL-259/SO-239.....	\$2.00
MLS RIGHT ANGLE PL-259 to RG-58U.....	.75¢
GLP RIGHT ANGLE SO-239 to RG-58U.....	\$1.00
M-RING car body mount 2 x SO-239.....	\$1.00
UG363/U 2" feed thru D/F 2 x SO-239.....	\$1.50
CABLE PLUG for RG-213 cable.....	\$4.00
BNC CONNECTORS SILVER PLATED WITH TEFLON INSERT:	
UG88/U male in-line plug for RG-58U.....	\$2.00
UG1094A/U panel mount socket.....	\$2.00
UG89/U in-line socket for RG-58U.....	\$2.00
UG914/U double female adaptor.....	\$3.00
UG491A/U double male adaptor.....	\$4.00
UG255/U BNC male to SO-239.....	\$2.00
UG273/U BNC female to PL-259.....	\$2.00

### MICROPHONE CONNECTORS

2, 3 & 4 pin plugs and sockets.....	each \$1.00
5 & 6 pin plugs and sockets.....	each \$1.50
8 pin plugs and sockets.....	each \$2.00

All prices are NET, ex Springwood NSW, on pre-payment with order basis. All risk insurance is free of charge, allow for freight charges by air, road, rail or post, excess will be refunded. Prices are subject to change without prior notice. All orders cleared on a 24 hour basis after receipt of order with payment.

Proprietor — ROY LOPEZ (VK2BRL)

## AT LAST!

A welcome card in the mail, was from Ann F6CYL for a contact with G3JKI/5A in June, 1980.

As one well known DXer told me, it won't be long before some of the new chums to HF DXing will be up in the top echelon of country holders who have occupied those positions for many years.

Cards currently being accepted by the WIA Federal Awards Manager are 60ØDX, VK4NIC/3X and G3JKI/5A.

## DID YOU KNOW?

KC6GZ and KC6VY can be obtained from W6TPC.

ZK1AR, Cook Islands via AA6Z.

KA1AA is WA4TKA not WA4KTR.

9G1AP 28.505 at 06:30 daily.

VQ9AA 14.175 10:00, Carribean Net.

EL2AK and FR7BY on 28.505, 07:00 week-ends

J28AZ, 21.255, 12:00 weekends.

XT2AU, 21.202 at 05:00

3D6AB, 14.185, 14:30

J3AH, 21.203 and 14.265 at net times.

9X5AB, 14.105, 15:00

## MORE MANAGERS

FR7CE via DF2OU

C6ADV via N7YL

J3AH via W2GHK

3D6AB to Box 133, Mbabane, Swaziland

J28AZ via 18JN

FR7BY via ISØIFA

VQ9AA via AJ3N

FM7CD via F5VU

SVØBL/5 via K9QXY

Above thanks to VK2DXH

## IN BRIEF

For Mongolia try JT1103 SWL N. Khos-bayar, Box 74 Ulan Bator 28 with US\$1. He

says he manages for JTS1A, 1KAA, 1KAI, 1BF, 1BM and JT1BG.

VP2ARS was Marty OH2BH and wife OH2BE. QSL via OH2BH.

A9XCE heard 03-04:00 on 14.020; try also 21.020, 28.020, 7.012 and 3501.

M11PA was the International Police Association. QSL via WA8VDC.

HL9DX is AI5P until November.

9H1FBS is the First Blind Station licensed in Malta.

HZ1AB manager Leo, K8PYD is out of cards and waiting a reprint.

PAØWAY/A6X is active again on 21.286 at 21:00. Cards are not acceptable, either here or in US unfortunately so have only collector value.

WA2VUY and KC4CT are responsible for bringing up LU1ZA, LU3ZY and VP8AEN at 01:00 on Tuesdays and Fridays on 20 metres.

D4CDC was activated by KA1CY on 40 and 15 CW. Cards to home address.

VP1SGX was operated by JA1SGX and cards go there.

KS6DV/KH1 and T3ØAC was same station and counts separate on DXCC list.

Cards for both to Larry Gandy KS6DV.

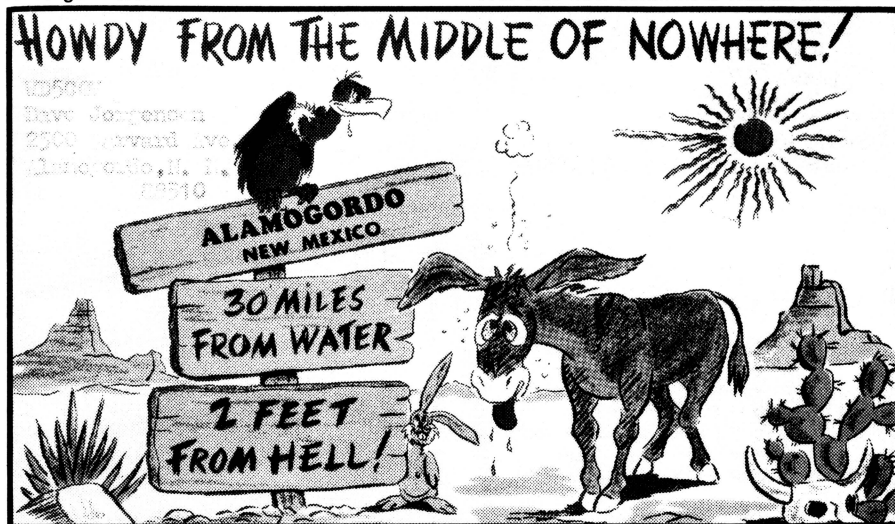
## ZL3 Reports

Neil, ZL3NE says that April and May were the months worth waiting for in the South Island with the following heard and worked. C6ADV, VP1A, VP1MK, ZF2DN, FO8DR, KP4AAN, KP4EOR, W1HOY/KP4.

During April, W5, 6 and 7 areas were also worked and KP2A, AH8A, H44PT, KG6-JDX and DX, P29ZFS and numerous Japanese contacts around midday local time.

Neil says that he has 500 plus contacts outside New Zealand since November with 47% to Japan, 17% to VK, 16% to USA, 10% to other countries and 10% to New Zealand.

Signals from Central America and Carribean were particularly strong at the beginning of April, and during one opening, the KP4 stations were contacting EA3 and ZB2 while the band was open to ZL. Neil has 20 countries now confirmed. Thanks Neil.



# VHF Band News

My trip to New Zealand meant that I was not around to hear the goings on on 28.885.

The day before leaving I missed out on FO8DR yet again due to the 50 to 52 MHz difference.

The 50 MHz section was ripped off the hapless amateur years ago by some technical bungling. The authority responsible should admit to this and reallocate the segment to the amateurs on a non interference basis. Which is just the inferred conditions placed upon users of 52MHz in Channel O areas all the years, anyway.

For heavens sake let us have a shot at Cycle 21 DX on 50 MHz before the whole darn thing has fizzled out.

## ZS-VK.

Unconfirmed reports of contacts between VK5 and ZS6 have not been backed up in writing so we will wait and read about it in the 'Official Blurb'.

Remember again, no input means no output, so don't complain when you seen that the VHF news is a little short at times.

## VK9ZYX

VK6ZLL should be active from Cocos-Keeling about now on 52MHz. As VK9NYG cannot operate on 28.885, another frequency will be required for liaison.

VK9XW also has 6 metre equipment. Try 14.110 MHz at 01:00 following the Sunday VK6 Callback.

VK9NL and VK9NS — both on Norfolk Island — using Icom 551D have been worked by JAs.

## VK9Z-W7.

Dave says that he worked W7KMA and two other Arizona stations on May 1st around 01:30 GMT. Signals were at best, 5x5, while his 10 watts was only received at 5x1 in the US.

I believe this is the first time the US has worked Willis Island territory on 6 metres.

## VP2VGR - RECORD

Cards have been received confirming the 10,327 mile QSO with Tim, VP2VGR on 52.005 2xCW in March. They have been forwarded to Bill Rice for entry in the book of VHF records.

# EASTERN

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- SM220 MONITORSCOPE
- TL922 LINEAR

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**THE STATE OF  
THE ART**

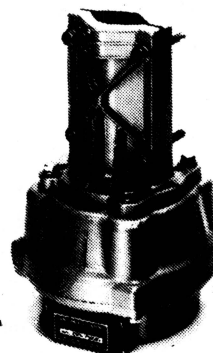
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- IC251 2m FM/SSB
- IC260 2m FM/SSB
- IC255 2m FM
- IC22S FM
- IC22U FM.

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**DAIWA**





Thanks to Andy, VE1ASJ, of the Canadian DX Association for his speedy processing of the logs and cards. Any cards for VE1 area should go to the Central QSL Bureau, PO Box 51, St John, New Brunswick, Canada, E2L 3X1.

## MORE CARIBBEAN ACTIVATION

W8ONQ says that WA3OJX, WA8OGS, WA8ONQ, WA8NJR, WB8IGY, W9OEH, VE1AVX and VE1ASJ are heading for VP2A (Antigua) and VP2M (Montserrat) during the VHF Contest and also early July.

## UP TO DATE

### KP4-ZD8.

Not content with all the 6 metre activity and contacts that Ted has created, ZD8TC has now been heard in KP4 on 2 metres, 16 Feb, 1981. The pair are currently working on a two way QSO.

### KH6IAA.

During the contacts to VK5, KH6IAA worked ZS6LN, ZS5TR and ZS5OM as well as H44 and others.

### EL2AK.

Tony is now active using IC551 and pair of 4X150s to 4 elements.

## HOWS YOUR DX

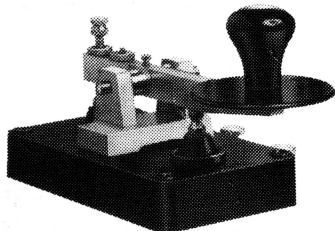
The following beacon list supplied by the West Coast DXB is current . . .

50.003 PY1RO.  
50.005 H44HIR.  
50.005 VE8R.  
50.005 W6HTH/KH6 keyer,  
50.008 KØGUV.  
50.010 ZS1STB.  
50.012 LU8MBL.  
50.020 GX3VHF.  
50.028 PAORYS.  
50.023 HH2PR.  
50.025 6Y5RC.  
50.030 ZS6PW.  
50.035 ZB2VHF.  
50.036 HC1JX.  
50.038 FY7AS.  
50.040 ZS6VHF.  
50.040 KL7CDG  
50.040 WA6MHZ  
50.045 DL3ZM/YV5.  
50.048 VE6ARC.  
50.050 ZS6XJ.  
50.050 VE6NAB.  
50.050 W1EXN.  
50.055 WA9FEF.  
50.055 ZL1UHF  
50.065 WB5ZRL.  
50.065 YV5ZZ.  
50.070 ZS3E.  
50.070 VP9WB.  
50.073 W7KMA.

50.080 W1AW.  
50.085 WA6JRA.  
50.088 VE1ASJ.  
50.093 WA8FTA  
50.095 OA4AWD.  
50.097 FO8DR.  
50.099 KG6EQI  
50.103 N8AJD.  
50.104 K4EJQ  
50.105 KC4AAD.  
50.110 KG6DX keyer.  
50.110 AL7C.  
50.110 JD1YAA  
50.120 4S7EA.  
50.144 KC4IN.  
50.498 5B4CY.  
51.0125 ZL1UHF. TV HOURS.  
52.013 P29SIX.  
52.150 VK5KK.  
52.200 VK8VF.  
52.250 ZL2VHF.  
52.300 VK6RTV.  
52.320 VK6RTT  
52.330 VK3RGG.  
52.350 VK6RTU.  
52.370 VK7RST.  
52.400 VK7RNT.  
52.425 VK2RAB  
52.435 VK3RMV.  
52.440 VK4RTL.  
52.450 VK2WI.  
52.500 JA21GY.  
52.510 ZL2MHF.  
52.800 VK6RTW.  
53.000 VK5VF.



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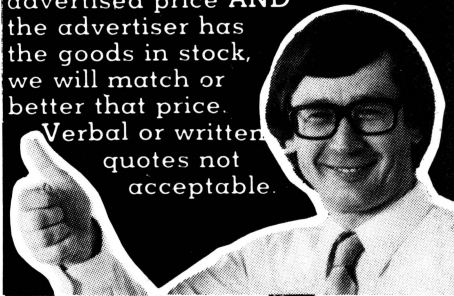
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DS861RB

# PREDICTIONS

Ionospheric Prediction Service is a section of The Department of Science and Technology.

## HOW TO USE THE CHARTS

These GRAFEX style predictions are prepared by the Australian Ionospheric Prediction Service. They present in pictorial form the expected propagation conditions for HF communication between Australia and a number of important world DX areas.

For the long haul circuits, the "East" terminal refers to the eastern half of Australia and the "West" terminal to the western half of Australia. Additional information is supplied for short circuits to Papua New Guinea and New Zealand with predictions from individual Australian capital cities.

The horizontal axes of the graphs are the hours of the day in Greenwich Mean Time (i.e., not local time) from 0000 hours at the

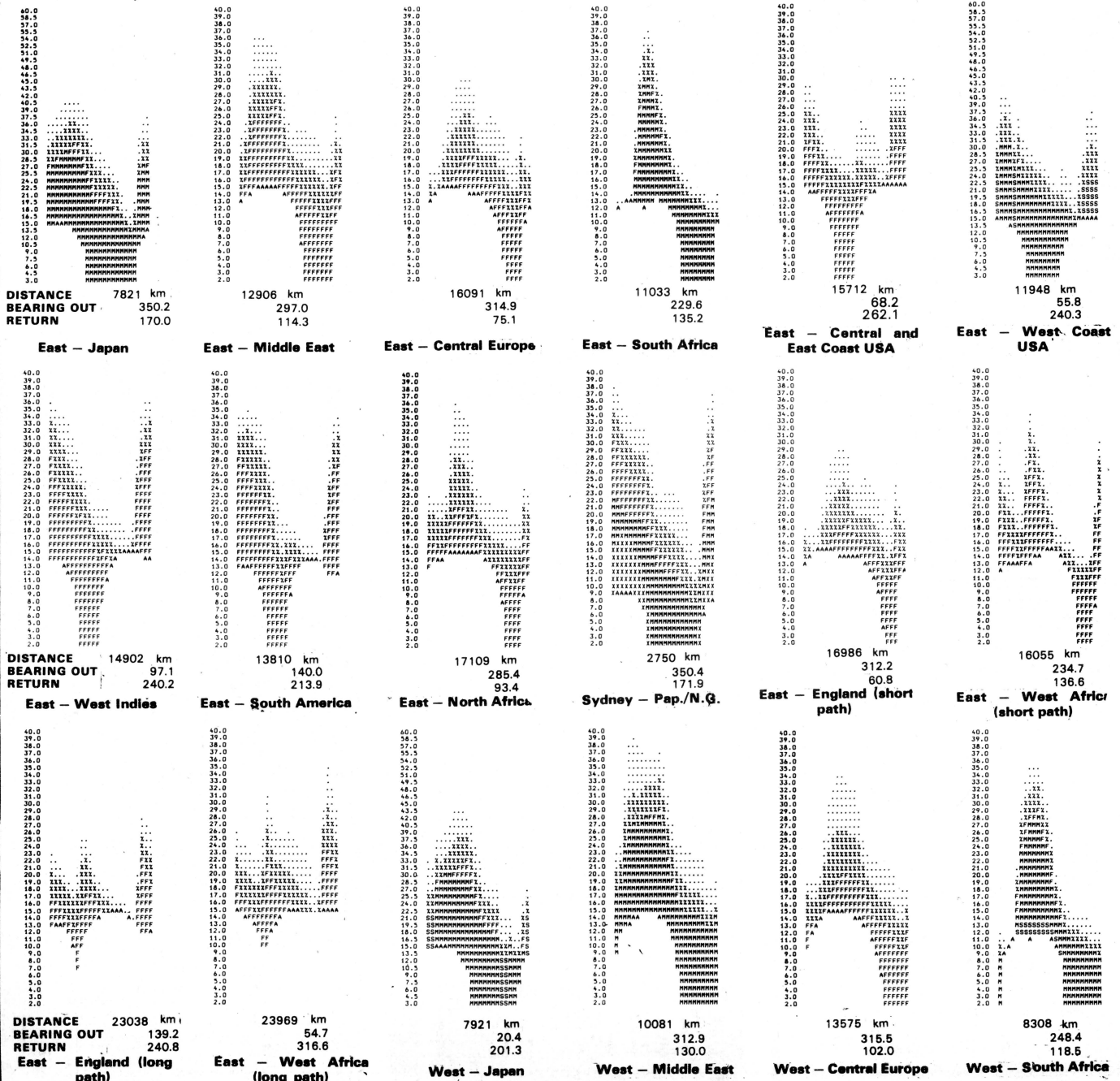
left to 2300 hours at the right. The vertical axes are the frequencies between 3 and 30 MHz.

A GRAFEX symbol represents the predicted propagation condition for a particular frequency at a particular hour. The following key explains the meaning of these symbols. The letter "F" designates the best conditions for HF propagation.

**GRAFEX frequency scales are now variable.**

During years of 'solar maximum' the MUF may predictably rise above 40MHz for some circuits.

In this event the scale will be suitably amended to indicate upper frequency excursions.





## LEGEND TO GRAFEX SYMBOLS.

'A' blank means propagation is not possible normally.

'.' Propagation is possible but probably on less than 50% of the days of the month.

'%' Propagation is possible on between 50% and 90% of the days of the month.

'F' Propagation is possible by the first F mode on at least 90% of the days of the month unless there is a severe ionospheric disturbance.

'M' Propagation is possible by both the first and second F modes. The strongest mode is normally the first mode but the vertical aerial pattern may influence the mode received.

'S' Propagation is not possible by the first mode but it is possible by the second mode. This symbol does not occur very often.

'A' High absorption i.e. above the ALF but probably too close to it for good communication.

'X' Complex mixture of modes including the second E mode.

40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	18614 km 52.9 299.6	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	14740 km 66.0 258.6	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	17983 km 135.5 218.8	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	14589 km 178.9 181.1	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	13941 km 294.9 106.3	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	4076 km 59.0 227.5
DISTANCE 18614 km		14740 km		17983 km		14589 km		13941 km		4076 km	
BEARING OUT 52.9		66.0		135.5		178.9		294.9		59.0	
RETURN 299.6		258.6		218.8		181.1		106.3		227.5	
West - Central and East Coast USA		West - West Coast USA		West - West Indies		West - South Amerik		West - North Africa		Perth - Pap./N.G.	
40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	5258 km 118.8 261.5	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	14474 km 312.9 92.9	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	13026 km 264.8 120.9	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	25550 km 132.9 272.9	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	26998 km 84.8 300.9	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	3166 km 4.5 183.6
DISTANCE 5258 km		14474 km		13026 km		25550 km		26998 km		3166 km	
BEARING OUT 118.8		312.9		264.8		132.9		84.8		4.5	
RETURN 261.5		92.9		120.9		272.9		300.9		183.6	
Perth - New Zealand		West - England (short path)		West - West Africa (short path)		West - England (long path)		West - West Africa (long path)		Melbourne - P.N.G.	
40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	2100 km 341.7 183.6	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	3722 km 359.9 179.9	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	2970 km 18.9 195.6	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	2507 km 133.4 300.9	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	3217 km 113.5 270.7	40.0 39.0 38.0 37.0 36.0 35.0 34.0 33.0 32.0 31.0 30.0 29.0 28.0 27.0 26.0 25.0 24.0 23.0 22.0 21.0 20.0 19.0 18.0 17.0 16.0 15.0 14.0 13.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0	5322 km 135.3 294.0
DISTANCE 2100 km		3722 km		2970 km		2507 km		3217 km		5322 km	
BEARING OUT 341.7		359.9		18.9		133.4		113.5		135.3	
RETURN 183.6		179.9		195.6		300.9		270.7		294.0	
Brisbane - P.N.G.		Hobart - P.N.G.		Adelaide - P.N.G.		Brisbane - New Zealand		Adelaide - New Zealand		Darwin - New Zealand	



# Club Directory

*Over the past few months there has been quite a lot of activity on the club scene. Several groups have sent information on their organizations, asking that we list them in our club directory. Others have sent in additions and corrections in existing entries. To help readers keep track of all the corrections we are repeating the listing.*

*If your club or organization would like to register in the directory, or make changes to an existing listing, write to The Editor, Amateur Radio Action Box 628E, Melbourne, Vic 3001.*

## NEW SOUTH WALES

**COFFS HARBOUR & DISTRICT AMATEUR RADIO CLUB:** P.O. Box 655, Coffs Harbour, NSW. 2450. Club net Monday nights at 8pm local time on 3.610 MHz. Club meetings Wednesdays at 7pm at Orara High School, Bray Street, Coffs Harbour.

**GOULBURN AMATEUR RADIO SOCIETY:** P.O. Box 350, Goulburn, NSW 2580. Club net Sunday night at 2100 East on 3.615 MHz. Meetings second Wednesday of each month at 2200 EST at Goulburn Police Boy's Club.

**MANLY WARRINGAH DISTRICT RADIO CLUB:** P.O. Box 186, Brookvale, NSW 2100. Meetings every Wednesday at 7 pm at the RAAF Radar Station, Beacon Hill.

**NORTH WEST AMATEUR RADIO GROUP:** Net every Monday night at 8:30 pm EST on 3575 kHz. Contact the Secretary, P.O. Box 133, Inverell, NSW 2360.

**SUMMERLAND AMATEUR RADIO CLUB:** Contact the Secretary, P.O. Box 524, Lismore, NSW. Net Friday nights at 8pm on repeater channel 6800 and 28.470 MHz. Also a 'Dawn Patrol' on 3.610 MHz at 6:30 am local time.

**TAREE AMATEUR RADIO CLUB:** Meetings at S.E.S. Headquarters, Victoria Street, Taree on second Tuesday of the month at 7:30 pm. Club net Mondays on 28.480 MHz at 8pm. Classes for NAOCP and AOCF at Chatham High School, Davis Street, Chatham, Wednesdays at 6:30 pm. Address P.O. Box 712, Taree, NSW 2430.

**WESTERN SUBURBS AMATEUR RADIO CLUB:** c/o Bass Hill RSL Club, Box 151, Yagoona, NSW 2199. Club callsigns VK2BWS.

**WESTLAKES AMATEUR RADIO CLUB:** PO Box 1, Teralba 2284. Club callsign: VK2ATZ. Meetings: Saturday afternoons and Wednesday evenings. Membership: Eric Brockbank, address as above or phone: (049) 52 2054.

## VICTORIA

**AUSTRALIAN LADIES AMATEUR RADIO ASSOCIATION (ALARA):** Meets monthly in homes of members. Net held on Monday nights on 3.570 MHz at 10:30 GMT. Enquiries to the ALARA Secretary, P.O. Box 38, Frankston, Victoria 3199.

**DJERRIWARRH AMATEUR RADIO CLUB:** Callsign VK3BRW, Location Melton Technical School, Wilsons Road, Melton South, 3338. Meetings 1st Tuesday of each month at above address, starting at 7:30 pm. Novice classes all other Tuesdays. Correspondence to P.O. Box 29, Melton South 3338.

**GEELONG RADIO & ELECTRONICS SOCIETY:** P.O. Box 962, Geelong, Vic. 3220. Club callsign VK3ANR. Meetings 7.30pm each Thursday Night at the Club Rooms, Breakwater Road, Belmont Common. Novice Classes conducted each Thursday night at 7.15pm. Publicity Officer George Wilson, Phone No. (052) 223004. All facets of Radio & Electronics catered for.

**GIPPSLAND GATE RADIO CLUB:** VK3BJA. Meetings 2nd and 4th Fridays of each month at the Oakwood Park Scout Hall, Heyington Crescent, Noble Park at 8 pm. Club net on 3.620 MHz at 7:30pm Thursdays and 28.400 MHz on 12 noon Sundays. Postal address P.O. Box 98, Dandenong 3175.

**THE MOORABBIN & DISTRICT RADIO CLUB:** Meetings the 1st and 3rd Fridays of each month at the Combined Clubs Hall, Turner Road Reserve, Highett commencing at 8pm. Callsigns VK3APC and VK3VXM. Club net on 28.450 MHz at 8pm each Friday. Enquiries to P.O. Box 88, East Bentleigh, 3165.

**THE SHEPPARTON & DISTRICT AMATEUR RADIO CLUB:** Meets the 1st Wednesday of each month at 7:30 pm. at the Mechanics Institute Hall, Wyndham Street, Shepparton. An informal meeting is also held on the 3rd Wednesday. Club callsign VK3DBS. All enquiries to the Secretary, P.O. Box 692, Shepparton, 3630.

**TALLANGATTA RADIO CLUB:** c/o L.R. Peters, RMB 4113, Tallangatta, 3700. Net each Friday at 7:30pm on 3.600 MHz. Meetings 2nd Sunday of each month at Tallangatta High School, starting at 7:30 pm.

**WESTERN SUBURBS RADIO CLUB:** c/o Melbourne Caravan Park, Elizabeth Street, East Coburg, Club callsign VK3AWS. Meetings 1st and 3rd Friday of each month at 8pm. Contact Neil May VK3VZY (03) 380 5810.

**WIRELESS INSTITUTE OF AUSTRALIA — MIDLAND ZONE.** Meetings at club rooms, Inglewood Street, Bendigo on the 3rd Friday of each month, starting at 8pm. Visitors most welcome. Mailing address is 4 Button Street, Bendigo, 3550. Phone (054) 43 7403.

## QUEENSLAND

**BRISBANE NORTH RADIO CLUB:** The club meets at the W. H. Hooper Centre, State School, Wavell Heights at 7.30 pm every 2nd and 4th Friday of the month and all are welcome. Postal address: P. O. Box 78, Chermside 4032. The club conducts a net on 28.42 MHz each Monday at 0900 GMT for members and the club callsign is VK4WIN. Secretary: Mr B. S. Fielding VK4ABS.

**CAIRNS AMATEUR RADIO CLUB:** Meets on the second Thursday each month at 8 pm at the Club situated in S.E.S. Headquarters, McNamara Street, Cairns. All visitors most welcome. President Brian Clark VK4AAU, Secretary Anne Benson VK4NXX, phone 53 4115. Club callsign VK4HM. Cairns Black Marlin Award — 7 points required, either 7 contacts with Club members living within 100 km. of Cairns or 5 members living in same proximity, and Club Station. Cost \$1 together with Log extracts, to CARC, Box 1426, Cairns, Q. 4870.

**DARLING DOWNS RADIO CLUB:** Meetings held monthly (except December) at the Toowoomba Education Centre, Baker Street, Darling Heights, Toowoomba, at 7.30 pm. Club net every Saturday at 0930 GMT on 3.587 MHz.

**GYMPIE AMATEUR RADIO CLUB:** P. O. Box 384, Gympie, 4570. The club meets at the Gympie High School on the 2nd Tuesday of each month. A net is held on 3.570 MHz every Wednesday night at 8 pm. Callsign VK4WIH.

**MACKAY AMATEUR RADIO CLUB:** P. O. Box 1065, Mackay, Qld 4740. Club Callsign is VK4WIM and meetings are held on the first Friday of every month at 8.00 pm at the State Emergency Service Building, Swayne Street, North Mackay. Club net operates Friday from 8.30 pm EST. Enquiries should be sent to the secretary, George Glen-dinning, at the above address or phone 51 2410. Club net frequency is 3.615 MHz.

**SOUTH-EAST QUEENSLAND AMATEUR TELEVISION GROUP:** Meetings 1st Friday of each month at the Hooper Centre, Wavell Heights School, Kuran St, Chermside. Liaison frequencies — most nights on 147.400, 147.425 and 147.450 MHz with a listening watch on 28.3 MHz for interested Novices. Repeater licence granted to VK4RQT. Secretary Tom Ivins VK4ABA, telephone number 264 1278. Address PO Box 3, Chermside, 4032.

**SOUTHEAST QUEENSLAND TELETYPE GROUP:** P. O. Box 184, Fortitude Valley, 4006. Club callsign VK4TTY. Meetings in the Library room of St Brendan's School, Hatree Street, Moorooka on the 1st Friday of each month except January. Starts at 8 pm. Club repeater on VK4RBT on 147.650 input, 147.050 output, located on Mt. Cotton. Club net on Sundays at 10.30am on the repeater and RTTY frequencies. Contact club for details of RTTY award.

**SUNSHINE COAST AMATEUR RADIO CLUB:** All correspondence to the Secretary, PO Box 80, Nambour, 4560. Club callsign VK4WIS. Club net each Thursday from 7 to 7.45 pm on 3.595 MHz, then 7.45 to 8.30 on 28.400 MHz. Club meets first Tuesday of each month at 7.30 pm in the Bli-Bli Public Hall, Willis Road, Bli-Bli. Visitors welcome. Club repeaters VK4RNC channel 5, 70cm input 438.075 MHz, output 433.075 MHz. Club award is the "Pelican Award".

## **SOUTH AUSTRALIA**

**SOUTH-EAST RADIO GROUP:** PO Box 1103, Mount Gambier, 5290. Club callsign VK5SR. Repeater VK5RMG channel 6. Meetings 3rd Friday of the month at the clubrooms, Olympic Park. Blue Lakes Award — work 5 club members. For information contact the Secretary, (087) 25 3287.

## **WESTERN AUSTRALIA**

**PERTH RADIO LEAGUE OF WESTERN AUSTRALIA:** PO Box N 1102, GPO Perth, 6001. Club callsign VK6NFL. Meetings second Tuesday of the month, 2000 WST. Club station on-air weekends. Club conducts Novice classes.

**SOUTHERN ELECTRONICS GROUP:** Meetings 1st Monday of each month at 8 pm. Location QTH of VK6XY, 242 Serpentine Road, Albany, 6330. Club Secretary G. H. Tomkins VK6AGT, 12 Burville Street, Albany. All visitors welcome.

## **TASMANIA**

**NORTHERN BRANCH OF THE W.I.A.:** P.O. Box 275, Launceston. Club call VK7NB. Meetings: second Friday each month at clubrooms 34 Bourke St., Launceston. Further information: write to the Secretary, c/o the above address.

**NORTH WESTERN BRANCH OF WIA,** Postal address — PO Box 194, Penguin, 7316. Callsign VK7NW. Meetings are held for members every second Tuesday at 7.30 pm at the Penguin High School. ATV and Micro-processors interested persons meet on second and fourth Friday every month at Penguin High School, contact Tony VK7AX.

**SOUTHERN BRANCH OF THE WIA:** P.O. Box 123, Sandy Bay, 7005. Meetings, first Wednesday of each month at State Emergency Service, Melville St., Hobart. Enquiries, Harvey Skegg. Phone 43 6337 (VK7HK).

## **NORTHERN TERRITORY**

**DARWIN AMATEUR RADIO CLUB:** PO Box 37317, Winnellie, NT, 5789. The club callsign is VK8DA and meetings are held on the first Monday of each month, 7.30 pm at the East Point Reserve. The club is affiliated with the WIA and inquiries should be directed to Barry Burns on (08) 85 1068 or via the above address.

2

# QSL CARDS!

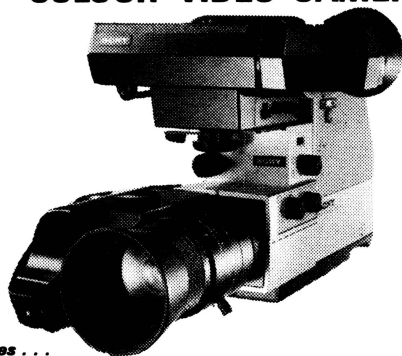
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## **SONY HVC-2000 PE PORTABLE COLOUR VIDEO CAMERA**



### **Features . . .**

- 2/3" MF Trincolor pickup tube developed by Sony to deliver sharper resolution and greater color fidelity
- Superb 6-to-1 Canon F1.8 motor-driven zoom lens with macro setting for super close-ups
- Built-in electronic viewfinder with 1½" B/W picture tube that lets you see exactly what you're recording
- 2.8X viewfinder magnifier lens
- Automatic or manual iris control for perfect video pictures in every shooting situation
- 4-position White Balance selector with fine adjustment white filter capability and conversion filters for more convenient color temperature adjustment
- Tally/battery level, low light, white balance/iris, and video level indicators
- Peaking switch for easier focusing, fatigue free viewing
- 3-position sensitivity selector for low light level, automatic operation in normal light, or high light level
- Automatic fade-in/fade-out control
- 3-position sharpness selector (high, normal and soft)
- Built-in condenser microphone, external microphone jack
- Remote control capability for zooming, tape recorder on/off, standby lamp and tally lamp
- Operates with Betamax portable or home recorders

## **SONY SL-3000 E PORTABLE BETAMAX VIDEO CASSETTE RECORDER**



### **Features . . .**

- Lightweight, compact design for easy portability in every recording situation, indoors or outdoors
- Records over 3 hours on a single L-750 Betamax videocassette
- Pause feature allows you to stop tape running in Record, Playback, or Audio Dub mode
- Audio dubbing allows you to add commentary, music, or other audio material to previously recorded videocassettes
- TP (Timing Phase) circuit assures smooth picture without noise or distortion at the connecting points between recorded programs or program segments.
- Sony's direct drive tape transport system
- Moisture sensor automatically shuts off operating capability when excess moisture is present, protecting against damage to recording head or videocassette.
- Three-way power operation allows total portability in every situation with your choice of rechargeable BP-60 battery pack option, AC-345C power adaptor option, or DCC-2450E car battery adaptor option.

## **INTERCAPE- VIDEO RECORDER CENTRE**

**19-21 Lonsdale Street, Melbourne, Victoria 3000**  
**Telephone: (03) 633 086, 633 196**

**KENWOOD TV506** 6m transverter with all cables manual as new \$150. 1674/25w 52.525 base plus Vinten Vantage lot \$50. Pye base 53.032 25w metering rack mounted complete \$30. 2 x steel 19" racks \$10 each. Yaesu RSM2 gutter mount with 2 metre stub \$25.

**FOR SALE 144 & 52MHz** transverters built in AC supply \$185. Geloso VHF 144 MHz TX \$50. Siemens 16mm projector as new \$300. Courier 40ch SSB/AM CB 858 chip \$80. Phone (043) 96 4553

**WANTED RADIO** and TV station stickers will swap. Write to Collector PO Box 50, Dungog 2420 NSW

**MULTI PALM 11** extra xtals \$140 IC2A original packaging \$260. Contact Steve VK2ZVG (02) 439 7873

**POWER LINE** interference if you have a problem or a solution forward technical details or a 9 x 4 SASE for some useful information. Also TVI/AFI data VK3QQ. 38 Wattle Drive, Watsonia 3087.

**SELL FT101B** excellent order with YD844 desk microphone \$450 ono or will swap for 6m or 2m transceiver. Phone Norm VK7NR (003) 94 4192. Yallabe Exeter Tas 7251

**FOR SALE Bargain Kenwood 520S** and DG 5 digital readout. Purchased new July '79, not used much. With manuals and in original container and with leads \$650 firm. Big saving. QTHR Mike VK2VRB (043) 32 1760. Bateau Bay.

**PYE 9MHz SSB** filter with U/s and L/S car Xtals \$45. VK2AZH (02) 543 4094

**FOR SALE FT101E AC/DC** with leads hand and desk mics, fan 27-27.5 \$610 ONO. Will pay postage. Phone Alice Springs Radio, telephone 347.

**MIC COMPRESSOR** Katsumi. MC 701 little used. Digital Clock Dick Smith, Hi volt kit, assembled and working in 24 hour mode not in case RF protected \$20.

**QLD QSL CARDS** any quantity required for amateur radio youth club wall display to promote amateur radio interest. Write VK4AIS QTH 69 Sixth Avenue Bardon, Brisbane Qld. Phone (07) 36 5273

# CLASSIFIEDS

**YAESU FT200 TCVR** with PSU. Very good condition. New driver and finals. Cooling fan fitted. Spare valves including 7360 balanced mod. Has 11m. Sell complete with mike and manual \$350 firm. VK4VBI. Phone (07) 48 5232

**SPIDER QUAD** hub; heavy duty, excellent construction, see quad handbook. W6SAI \$60 Craig (03) 459 5406

**SELL BEARCAT** scanner model 210 with operating manual. Unit in good condition \$280. Phone (07) 349 4347

**YAESU FT101E** transceiver 10 thru 160 metres 260 watts with Yaesu deck microphone. In spotless, as new condition. Recently returned for top receiving on all channels, bands. \$660 ONO ask for Bob (VK3VDI) Work phone 620 141 ext 416 AH 314 2027

**CONVERTED CB** radio mobile 10m needs RF stages tuned \$100. Ask for Bob. VK3VDI. Work 620 141 ext 416 AH 314 2027 6 - 9 pm

**THREE ELEMENT** quad antenna 10/15 MTR duo band featuring sturdy alum construction and hollow fibreglass spreaders gamma matched for easy tuning. With 2 x 25m balanced coaxial feedlines \$140. Ask for Bob VK3141 work 620 141 ext 416 AH 314 2027

**KENWOOD TS-520S** transceiver 160-10 metres, with DG-5 digital display readout and MC-50 desk microphone. This equipment is in excellent condition. Best offer or will split. After 6 pm Melbourne (03) 726 7248 David. Country enquiries welcome.

**SWAP IC502** 6 metre portable for PLL CB set (27 or 28 MHz) or \$120. VK6AM 10 Julianne St, Busselton WA. Phone (097) 55 4106

**YAESU FTDX 401** very good condition with mic and manual \$375. VK2VXX Phone (049) 435 218

**ICOM IC-502** 6m SSB portable, perfect condition, swap for DG-5 display or AT-200 or sell for \$160. VK2DFI (02) 452 4726 AH (02) 230 5236 BH

**YAESU FTDX 401** with YD 844A desk mic. Good condition \$340. 1000W dummy load \$45. 1000W LP filter \$30. Phone (03) 786 4639

**WANTED CIRCUIT DIAGRAM** of English made CCTV camera Beulah model D800. I will pay for photo copies and postage. Write Tom VK3XBC 15 Tennyson St, Traralgon 3844.

**NATIONAL DR 49** communications receiver. General coverage plus FM, digital readout on all bands. Very good condition \$430 ONO. Phone Ian Johnson (07) 225 6944 business hours, Monday to Thursday.

**WANTED CIRCUIT DIAGRAM** for Pride 100A Linear amplifier or information regarding biasing. Will beg borrow or buy. Ben VK3KBC QTHR Phone (03) 363 2609

**ALPHA LINEAR 374A** Swiss quads 10 15 6 metres new TH6 tri band beam 2 metre 80 watt linear solid state IC551 TXCR W/PBT all mint. Phone (03) 240 1231 Bus 509 8637 AH

**FOR SALE 120 metres** of stranded 5mm copper wire. Going at a price of \$36. Phone (03) 93 1439

**FOR SALE UHF** and VHF microwave module transvertors, KF430 UHF/FM TCVR, Belcom Pace 28MHz, TCVR IC 502 C/W nicads. Multi Palm 11 2M/FM handheld, Hustler HF/mobile whips 80 - 10M. Good prices. Phone Derek VK3BYA QTHR (03) 211 3566

**HEATHKIT HW100** five band transceiver with matching speaker and power supply. Also SB610 monitor scope \$300 the lot VK3ZJY QTHR (03) 306 8484

**WANTED YAESU FT620B** 6M transceiver must be mint cond. No faults. Details to Vince VK2VC QTHR Phone (02) 713 6655

**TS520D MINT** condition overhauled Kenwood dist. New finals mic Manual spare finals. Excellent performer. Both TX and RX fitted AC DC power supply DG5 adaptor \$485. Phone Brisbane 284 9230

**FOR SALE TS820A** with AC DC converted and CW filter \$750. Bruce VK2BAV QTHR 98 7797

**YAESU FT7** good condition \$375. Phone Neil VK3BCU (03) 379 5807

**COLLINS S-LINE 755-3** receiver, noise blanker, full set. Skytec solid state tubsters \$600. 325-1 transmitter with 516FZ power supply, speaker, spare valves \$600. VK4AJ Gene Tiller, 3 Owen Street, Toowoomba. Phone (076) 38 1113

**FOR SALE TS 520S** as new in original carton. \$580. Phone (076) 32 3048

**PW "HELFDOR"** transceiver builder of this (with modifications) would like to exchange ideas and experiences with other builders. Phone Ken (042) 56 2323 or 24 Oak Street, Albion Park Rail NSW 2527

**BORED WITH** ordinary QSL cards? Impress your contacts with high quality professionally hot-stamped plastic badges bearing your call sign and details. Phone Sands Badges (03) 728 4545

## GREAT CIRCLE MAPS ARE OBSOLETE

At best, a Great Circle map can only give you a very rough beam heading. \$7.50 will bring you a computerised list of over 400 beam headings to all ARRL DX countries based on your own QTH. This listing includes separate headings to all American States and Canadian Provinces. You supply the lat/long of your QTH (or we can check it out for you) plus a cheque or money order for \$7.50 and receive the listing (which includes prefix/country/zone/continent/short/long path headings plus miles/kilometres) by return mail. Whether you're a fanatical DXer or a casual rag-chewer, this computerised list of beam headings is a once-only investment and an asset to any shack. Available from: BINT Services PO Box 323, Cheltenham, 3192, Victoria.



WANTED TO BUY external VFO and CW filter for FT101. Neil VK3AVK (03) 729 5414

UHF RECEIVER wanted 30 MHz - 550 MHz full coverage pref. AM SSB FM details ot L. Smith 30 Frederick St Glen-gowrie SA 5044

FOR SALE Kenwood R1000 comm receiver complete with instruction manual. 200KHz to 300MHz \$400. For more details phone (08) 276 8602

SONY 2001 KEYBOARD entry general coverage receiver, 150KHz - 300MHz. AM FM SSB. With 500W, 5v supply. \$265. (03) 82 7288

WANTED BIRD thru line watt metre. VK2YEE. Phone (02) 533 2753. PO Box 47, Peak-hurst 2210

RECEIVER SANYO RP8880 excellent condition 2.2 - 30MHz in 5 bands. Also AM B'cast, FM and longwave, BFO enables reception of USB, LSB and CW. X'tal marker for calibration. Ideal for keen beginner. Very cheap at \$190 ono. Call Scott (03) 786 6865 VK3VWL

ICOM 701, HF transceiver with PS 701 supply, SM2 deskmic and RM2 remote control. All latest factory mods, unmarked \$890 - complete (03) 82 7288

IC 502 52 - 53 MHz SSB/CW with batteries and mike \$200. Hidaka 4 el Yagi (6 metre) \$25. Manual for each. FT221R good condition \$400. VK4SN phone (076) 32 9957

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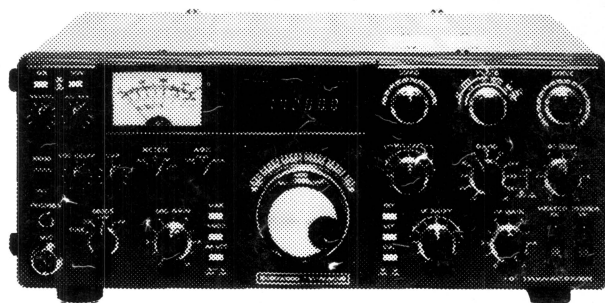
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